The Reader Writes—

Coming Features

Plastics in the Emergency,
By Dr. T. S. Carswell,
Monsanto Chemical Company.

Industrial Stream Pollution Problems and Their Solution,
By Richard D. Hoak,
Mellon Institute of Industrial Research.

Western and Pacific Northwest Materials for the Production of Magnesium,
By W. C. McIndoe,
Bonneville Power Administration.

Formulation of Unusual Specialties,
By Dr. C. A. Tyler.

Proper Illumination for Chemical Plants,
By engineers of General Electric Co.

Synthetic and Natural Rubbers,
By Dr. Wm. C. Geer.

Salt as a Chemical Raw Material,
By Dr. C. D. Looker.

The Synthetic Resins,
By Hovey and Hodgins,
Reichhold Chemicals, Inc.

Approves May Editorial

Mr. Rust and myself wish to congratulate you on the splendid editorial in the May issue entitled "Fiddling While Democracy Burns." It is a pity that more people do not express their opinions as clearly and forcibly as you did in that editorial.

FREDERICK A. HESSEL,
Ellis-Foster Company,
Montclair, N. J.

Drafting of Chemists

In the March issue of CHEMICAL INDUSTRIES on the Editorial page there appear some comments on the Selective Act (page 284, "Technicians and the Draft"). Apparently a few of your readers objected to your position on the Draft and some intimated that your articles lacked specific examples of actual cases where industry was experiencing difficulty.

I have found several such examples involving electrical engineers and in one case, a chemist. These are cited in a letter which is published in the June issue of "Electrical Engineering," the official magazine of the American Institute of Electrical Engineers, entitled, "Engineers and the Draft," the letter appears on page 309.

I call this to your attention in case you are interested in hearing about actual cases. The letter is based on six months' experience with the Selective Service Act, and while many of the difficulties have since been eliminated, a program of education is still needed.

W. S. FIELDING,
Pittsfield, Mass.

Suggests an Exchange

CHEMICAL INDUSTRIES would be more valuable if you would establish an exchange for products wanted or needed in industry. This would be similar in nature to "Industries' Challenge to Research." This would seem to be very desirable.

ALBERT G. SCHMIDT,
Palatine, Ill.

Series on Lacquers

I suggest that you give us a series of articles on lacquers in specialized fields, such as rubber, wood sealers and leather finishes.

CLARK GRAY,
Graven's Laboratories,
Davenport, Iowa.

CALENDAR OF EVENTS

July

July 8, Chemical Salesmen Association, Golf Tournament, Plandome Golf Club, Plandome, L. I.

July 23-25, American Society of Civil Engineers, Annual Convention, San Diego, Calif.

August

Aug. 7-9, American Water Works Assoc. Meeting Western Pennsylvania Section, Erie, Pa.

Aug. 12, Chemical Salesmen Association, Golf Tournament, Montclair Golf Club, Montclair, N. J.

September

Sept. 3, American Institute of Consulting Engineers, Luncheon Meeting, City Midday Club, New York, N. Y.

Sept. 8-12, American Chemical Society, Semi-Annual Meeting, Atlantic City, N. J.

Sept. 9, Oil Trades Association of New York, Inc. Sports Day, Pelham Country Club.

Sept. 10, American Institute of Consulting Engineers, Luncheon & Council Meeting, City Midday Club, New York, N. Y.

Sept. 10, Gypsum Association, Fall Meeting Commodore Hotel, New York City.

Sept. 10-12, National Assn. Printing Ink Makers, Annual Convention, Greenbrier, White Sulphur Springs, W. Va.

Sept. 16-19, Technical Asssociation Pulp and Paper Industry, Fall Meeting, Ann Arbor, Mich.

Sept. 17-19, National Petroleum Assn., 39th Annual Meeting, Hotel Traymore, Atlantic City, N. J.

Sept. 18, Louisville Paint & Varnish Production Club, Brown Hotel, Louisville, Ky.

Sept. 18, New England Paint & Varnish Production Club, Regular Monthly Meeting, Hotel Vendome, Boston, Mass.

Sept. 18-19, American Water Works Assoc., Meeting of Rocky Mountain Section, Santa Fe, New Mexico.

Sept. 18-20, National Association of Photo Lithographers Annual Exhibit and Convention, Netherland Plaza Hotel, Cincinnati, Ohio.

Sept. 22-25, Illuminating Engineering Society, Atlanta Biltmore Hotel, Atlanta, Ga.

Sept. 24-26, American Water Works Assoc. Meeting Michigan Section, Grand Rapids, Mich.

Sept. 25-26, Society of Automotive Engineers, National Tractor Meeting, Schroeder Hotel, Milwaukee, Wisc.

Sept. 29, National Wholesale Druggists' Assn., Annual Convention, Greenbrier Hotel, White Sulphur Springs, W. Va.

Sept. 29-30, National Lubricating Grease Institute, Ninth Annual Meeting, Stevens Hotel, Chicago, Ill.

Sept. 29-Oct. 2, National Wholesale Druggists' Association, N.W.D.A. Convention, White Sulphur Springs, West Virginia.

October

Oct. 1, American Institute of Consulting Engineers, Luncheon Meeting, City Midday Club, New York City.

Oct. 1-4, Electrochemical Society, Inc., 80th Annual Convention, Chicago, Ill.

Oct. 2, Indianapolis Paint, Varnish & Lacquer Assoc., Columbia Club, Indianapolis, Ind.

Oct. 1-4, Electrochemical Society, Inc., Semi-Annual Meeting, Chicago, Ill.

Oct, 6-10, The National Assoc. of Retail Druggists, 43rd Annual Convention, Statler Hotel, Cleveland, Ohio.

Oct. 6-10, National Safety Council, Inc., 30th National Safety Congress and Exposition, Stevens Hotel, Chicago, Ill.

Oct. 9-11, Texas Mid-Continent Oil & Gas Assn., 22nd Annual Meeting, Beaumont, Texas.

Oct. 12-15, The American Society of Mechanical Engineers, Fall Meeting, Louisville, Ky.

Oct. 13-16, Society of Motion Picture Engineers, Hotel Pennsylvania, New York City.

Oct. 15-17, American Society of Civil Engineers, Fall Meeting, Chicago, Ill.

Oct. 16, Louisville Paint & Varnish Production Club, Brown Hotel, Louisville, Ky.

Oct. 16, New England Paint & Varnish Production Club, Regular Monthly Meeting, Hotel Vendome, Boston, Mass.

Oct. 16-18, American Institute of Mining & Metallurgical Engineers, Petroleum Division, Dallas, Texas.

Oct. 20-24, American Society for Metals, National Metal Congress—National Metal Exposition, Philadelphia, Pa.

Week of Oct. 20, American Gas Association, Annual Convention, Atlantic City, N. J.

Oct. 27-31, National Electrical Manufacturers Association, Annual Meeting, Waldorf-Astoria Hotel, New York City.

Oct. 30-Nov. 1, Society of Automotive Engineers, National Aircraft Production Meeting, Biltmore Hotel, Los Angeles, Calif.

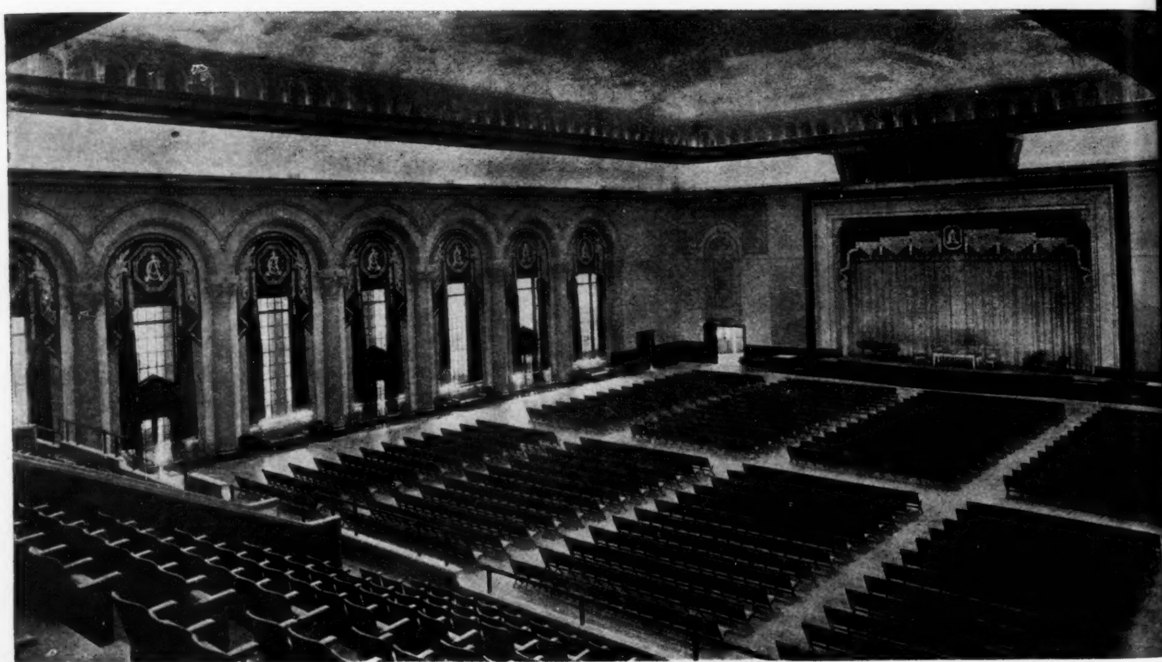
Oct. 31, California Natural Gasoline Assn., Los Angeles, Calif.

Oct. 31-Nov. 1, American Assoc. of Textile Chemists & Colorists, Annual General Meeting, Hotel Carolina, Asheville, N. C.

Atlantic City's $15,000,000 Convention Hall

Set sail for 102ND MEETING OF THE AMERICAN CHEMICAL SOCIETY

Don't miss it!



There are 20 Meeting Rooms in the Auditorium

Hotels and more Hotels, all close to the Auditorium

A.
C.
S.

Transportation is unique in Atlantic City

Fishing, Boating, or Sailing

Atlantic City, Sept. 8 to 12, 1941

Golf is even more enticing at the Seashore

Boardwalk Hotels

Key No.	Name	Single Rooms	Double Rooms
Official Hotels			
6–7	Chalfonte-Haddon Hall (Headquarters)	$3–$4–$5–$6–$7	$6–$8–$10–$12
22	Brighton	$7.50–$8	$14–$16
23	Claridge	$4–$5–$6–$9	$6–$7–$8–$11
28	Dennis	$3.50–$4–$5–$6	$6–$7–$8–$9–$10
27	Marlborough-Blenheim	$4–$5–$6	$6–$7–$8–$10
29	Shelburne	$4–$5–$6–$7–$8–$10	$6–$7–$8–$9–$10–$12
21	Traymore	$3.50–$4–$6–$10	$6–$8–$10–$12
31	Ritz-Carlton[a]	$3–$3.50–$4–$5	$6–$7–$8–$10
Unofficial Hotels			
32	Ambassador	$3–$4–$5–$6	$6–$7–$8–$10
33	Chelsea	$3–$4–$5	$5–$6–$7–$8
14	Knickerbocker	$3–$3.50–$4	$5–$6–$7
11	New Belmont	$2.50–$3	$4–$5–$6–$7
34	President	$3	$5.50–$7–$8
4	Seaside	$3–$3.50–$4	$5–$6–$7

[a] Reserved for Division of Rubber Chemistry.

Avenue Hotels

Unofficial

Key No.	Hotels	For One Person	For Two Persons	American Plan[b]
30	Arlington	$2.50	$4–$5	$1.50
19	Byron		$4.50–$5–$6–$7	$2.00
8	Colton Manor	$3–$4–$5	$5–$6–$7–$8	$2.50
25	Crillon		$6[c]	
26	Eastbourne	$3–$4	$5–$6–$7	$2.00
15	Flanders	$2.50–$3	$4–$5	$2.00
2	Franklin Inn	$2.50	$3–$4	
24	Glaslyn-Chatham		$5	$2.00
5	Holmhurst	$3–$4	$5–$7	
17	Jefferson	$3–$3.50	$5–$6	$2.50
18	Kentucky	$3	$4–$5	$2.00
9	Lafayette	$3–$3.50–$4	$5–$6–$7	$2.50
20	Madison	$3–$3.50–$4	$5–$6–$7	$2.50
16	Monticello		$4.50–$5	$2.00
3	Morton	$3–$3.50–$4	$5–$6	$2.50
10	Penn-Atlantic	$2.50	$4–$5	
13	Princess	$3	$4.50–$5	$1.75
12	Senator	$3–$3.50–$4	$5–$6–$7–$8	$2.50
1	Thurber	$2.50	$4	

[b] Additional charge per person per day.
[c] Continental Plan.

There are only a limited number of single rooms. Double occupancy is therefore desirable. Rates quoted are for rooms on European plan.

American Chemical Society
Hotel Committee, A. G. Keller, Chairman, 16 Central Pier, Atlantic City, N. J.

________________1941

Dear Sir: Please make hotel reservations noted below:

Hotel________________First choice

Hotel________________Second choice

Hotel________________Third choice

If the hotel of first choice is unable to accept the reservation, the Hotel Committee will endeavor to comply with your second or third choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

______Double rooms for ______ persons______ Rate desired $______ to $______ per day

______Single rooms______ Rate desired $______ to $______ per day

______Suites-parlor,______bedroom(s) for______persons—Rate desired $______ to $______ per day

______Students, 2 to 4 per room, $0.75 and up per person______per day

Arriving September...................., hour............A. M.............P. M. Leaving.............

Give names and addresses of all occupants including person making reservation:

Name	Street Address	City	State

Attach sheet listing additional names if necessary

Signature________________

CHEMICAL INDUSTRIES
The Chemical Business Magazine
Established 1914

Is Now the Time for Economy?

EMPHATICALLY yes! Facing a mandatory forty-four billion dollar defense expansion program to convert the United States into an "arsenal of democracy" requires careful scrutiny of every dollar for non-defense expenditures that is incorporated into the Federal budget for 1942. Curiously there does exist an economy bloc in Congress despite the "ne'er-do-well" attitude of the last eight years, but its voice is tragically weak only because the majority of American citizens who with their children and their children's children must inevitably pay the bills are strangely inarticulate. The end of the road is ruinous inflation of one sort or another and national disaster for rich and poor alike, for every man, woman and child and countless not yet born.

Declaring that most people do not yet realize the full share of their own burdens with respect to future payments to their government, Representative Wesley E. Disney of Oklahoma, leader of the economy bloc, asserted recently that it is the little people who must put real pressure on their Congressmen to make economies in non-defense appropriations, which is the only sane and moral course for a people confronting such a critical period as the United States faces today.

He warned against being fooled by mere titles and labels because a curious phenomenon is arising in which every bureau and department of the government, whose existence is threatened, has worked up some scheme to prove its worthiness as a defense project.

The magnitude of the defense program staggers the imagination. We may expect in the not-too-distant future a national debt of one hundred billion dollars which is in addition to an existing state and local debt of 20 billion dollars. This represents an average debt load of between $3,000 and $4,000 for every single family in the whole country. "Soak the Rich" as a slogan has ceased to be realistic for if the government took every dime of all individual net incomes in the United States over $5,000, it would yield less than enough money to pay current, normal annual expenses.

How can one reconcile the continuance of the present spending spree with the fact that business activity is at the highest peak in all history, far above the peak of 1929; that in the coming fiscal year the nation's income is expected to reach the extraordinarily high figure of 92 billion; that in the United States today more persons are employed than ever before in the country's history? Why does the government preach the doctrine of sacrifice yet continue a public works program on a "business-as-usual" basis? Why should our farmers receive huge government bounties while industry contributes more than four billion dollars a year in business taxes?

Only by positive action can results be obtained. The next two weeks are the critical ones. By writing letters and presenting resolutions to their Congressmen, business men and workers in all walks of life and their organizations can help greatly to strengthen the hand of the economy bloc in Congress in its efforts to reduce the Federal budget for 1942.

Following Secretary Morgenthau's recommendation for a cut of a paltry one billion dollars, the mountain has labored and brought forth a mouse. Congress has not received from business, labor or agriculture sufficient demand as yet for economy to justify serious retrenchment. Until it does, spending as usual will continue, despite our 20 billion dollar ordinary government cost; despite our 44 billion dollar defense program; and despite our 67 billion dollar public debt.

Democracy succeeds only when there is the will to make it work. The founders of this nation had no secret formula of perpetual motion when they adopted the constitution. If you still remember the rudiments of arithmetic write your Congressmen today and ask every relative and friend to do likewise. Otherwise don't cry when you get the bill.

Editorial

Transportation the Bottleneck?: Are we likely to see repeated the breakdown in transportation that plagued our World War efforts for months? Indications are that we will not, yet the situation is now one of grave concern not only with respect to petroleum but to a great many other important industrial products. At the National Fertilizer Association Convention at White Sulphur Springs last month the problem of moving phosphate rock, sulfur, potash and other important chemicals to East Coast consuming points was touched upon by several of the principal speakers.

The East Coast situation in petroleum is really quite serious, yet not quite as bad as Secretary Ickes, now oil czar, would try to make the country believe it is.

The withdrawal of some fifty-five tankers from a fleet of 250 that deliver daily 1,250,000 barrels to East Coast refineries from the Gulf Coast alone has created a bottleneck. Approximately 95 per cent of the petroleum products consumed in the East move there in tankers. The loss of the services of 55 tankers is equivalent to closing down 20 medium-sized oil refineries or plugging 30,000 oil wells.

Experts are pointing to four steps to alleviate the temporary East Coast shortage. 1. Make use of surplus tank cars of which the Association of American Railroads reveals there are 19,000, able to handle 200,000 barrels a day. 2. Switch industrial consumers to coal wherever possible. This cuts down on oil consumption but adds additional burden on the railroads, and incidentally reminds us that some 40 million tons of soft coal were lost through the strike in April never to be regained. 3. Foster voluntary public curtailment of gasoline. 4. Promote better home insulation and encourage home owners to improve the efficiency of oil burners by frequent servicing.

The stumbling block in the use of tank cars for oil movement is one of higher cost. It is said that such transportation adds an extra five cents a gallon while the average profit on a gallon of gas today is just about one-half cent. Experts suggest that the oil companies be required to move ten per cent by tank car and be permitted by the Office of Price Stabilization and Civilian Supply to increase the price of gasoline by one-half cent. It has been estimated that a ten per cent cut in consumption in gasoline can be made by a popular appeal to the public to conserve. Proper adjustment of oil burners could effect a saving of 20 to 30 per cent in fuel oil consumption, according to heating engineers.

Latest estimates place the construction of new tankers at only 28 this year instead of the 75 authorized. The two large pipe line projects that have been involved in red tape are now likely to move ahead rapidly with the passage of the Cole Bill, which gives Federal rights of way to interstate carriers certified by the President, yet completion is probably still 12 months away. Any further diversion of tankers in the next six months is likely to bring on additional complications in the present set-up.

How important the rail situation really is can be judged by the recent government action of giving a form of blanket priority to builders of freight cars and ship builders, putting them at the top of the preference list immediately behind the vital defense industries.

In the meantime industry can cooperate in preventing any transportation bottleneck. Ralph Budd, OPM Transportation Commissioner, outlined before the National Association of Shippers' Advisory Boards in Chicago on June 19 ten ways in which such cooperation can be obtained.

Among his suggestions were to load cars to the load limit capacity or the visible capacity as the case may be; to unload cars promptly; not to ask for delivery of cars until merchandise is actually ready for shipment; and to try to provide a six-day basis for loading and unloading cars. All shippers should obtain the complete detailed list of suggestions.

Ickes on Aluminum: If for no other reason than to set the record straight for posterity the unwarranted and outrageous attack on the Aluminum Co. of America by Harold Ickes, Secretary of the Interior, should be answered now. It is deplorable how many of our otherwise intelligently edited newspapers and general magazines have unwittingly become a tool in the hands of those who wish to pillory so-called "big" business. Such willful tirades can only lead any fair minded, informed and intelligent person to just one conclusion—that the Administration's interest in all-out defense is merely incidental to its desire to foster state socialism on this nation.

Can it be that Ickes and the rest of his ilk who infest high places of trust and responsibility are preparing to make industry the proverbial "goat" for all the sins of omission and commission they themselves have committed? Can it be that President Roosevelt can not or will not see through their nefarious schemes?

As "Al" Smith used to say so effectively—let's look at the record, a record by the way that is an open book of thousands of pages but one that Mr. Ickes deliberately chose to ignore. Through whose initiative, Mr. Ickes or the officials of the Aluminum Co. of America, will that company shortly be turning out some 60 million pounds of aluminum a month! In the past year the company has invested $200,000,000 of its own money in plant expansion—this at a time when the Government is spending billions of public funds in the erection of plants. In all fairness whose responsibility was it to determine how much of the metal was required for airplane construction, government officials of the army and navy or the President of the Aluminum Co. of America? Did or did not Mr. Ickes as late as last February refuse to grant the company's request for more electric power from the Bonneville dam on the ground that the company had a monopoly? Did he not urge instead that the Government start its own plants thereby losing valuable time when time is the very essence of success of our defense program?

Just what are we supposed to be doing—conducting a witch hunt or preparing to again make the world safe for democracy?

METALS and ALLOYS in Defense

By Bruce W. Gonser
Battelle Memorial Institute

Metals and alloys play an important part in our life whether for defense or peacetime applications. Concentrating as we are now on preparation for modern warfare, the U.S. is singularly fortunate that so few of our metals and alloys must be imported. In this article, the author gives us the whole story of our metals situation and compares it with the situation in 1916-1918. Read how well-fitted we are to play the role of war defense.

READY availability of metals has become an extremely important factor in modern warfare. All these new aeroplanes, tanks, trucks, army camps, and armaments of all sorts are avaricious consumers of metals. When, to the normal metal requirements of the United States in a reasonably prosperous year, is added the metal needed for rapid construction and manufacture of war supplies, and at a time when much of the trade of the world is disrupted, even our immense resources for metal production become

Above, Cruisers and battleships during fleet maneuvers. Below, torpedo bombers. (Official U. S. Navy Photo) Courtesy, *Metals & Alloys.*

Above, lineup of medium tanks, M-2, 7c 67th Infantry. (Photo by U. S. Army Signal Corps.) Courtesy, *Metals & Alloys.*

strained in places. Who would have thought even a year ago, for example, that we would be experiencing an acute shortage of zinc, or that nickel, aluminum, and magnesium would be unavailable except for applications in some way connected with "defense"?

Looking back at our metal supply situation in 1916-1918, many differences exist. Some metals, as antimony, mercury, and tungsten, which were largely imported at that time are now produced in this country. Substitute materials are better known and can be used more effectively. Thus, molybdenum high-speed steel now can be used in place of tungsten high-speed steel, if the latter approaches the scarce list; magnesium alloy castings can replace many parts formerly made from aluminum. There is not the stringency in supplies of individual metals that existed in 1917 and 1918, rather the sudden greatly accelerated demand all along the line has caught up with, and in some cases, passed the immediately available supply. There is a temporary scarcity in some of the metals which had been considered not only plentiful but good as substitutes for some of the really strategic metals. Anomalies exist, like the plentiful supply and reasonable price of tin, yet it is the one metal of which our production is so slight that at present 99.9 per cent. of our requirements originate in far distant countries. Bottlenecks in production may be the result of a lack of electrical equipment, furnace capacity, or labor relations as well as lack of raw material supplies.

More details concerning the metals and alloys used in armaments and their availability can be given best by considering them individually, or in small associated groups. Some of the applications which may be mentioned are by no means associated with the chemical industries, but to get a clear picture of the situation the chemical engineer and the executive must not only know something about the metals he requires for defense work but something of the various competing applications which may influence the supply.

Iron, Steel, and Alloy Steels

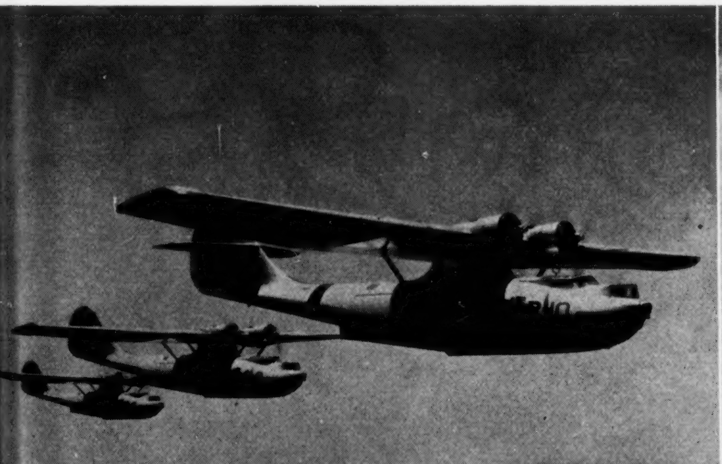
Obviously, steel is the backbone of armament materials. Many other metals are vital, too, but for all except flying craft, steel in castings, forgings and fabricated shapes is the basic structural material. The old war of developing an impenetrable armor and an irresistible projectile, as well as the construction of modern complex war machinery, has resulted in the extensive use of alloying constituents to give far better mechanical properties than is obtainable from simple carbon steels and cast irons. From the standpoint of strategic value, therefore, the position of such elements as manganese, nickel, chromium, molybdenum and vanadium is of great importance to armament manufacturers, although they may appear to be but minor constituents in the steel used.

To mention a few examples of steel applications for strictly ordnance uses, a nickel-chromium steel (about 1.75 Ni—1.0 Cr) is used for armor piercing projectiles, a straight high carbon steel has been found suitable for high explosive shells and shrapnel cases, rifle barrels are usually made from a 1.75 manganese or a chromium-molybdenum steel, a plain chromium steel serves for machine gun barrels, and artillery gun barrels are commonly forged from 3.5 nickel steel or from nickel-molybdenum steels. Armor plate consumes a vast quantity of nickel steel, of perhaps 3½% nickel. This armor may be as heavy as 13½ in. thick for belt armor on the largest battleships or a more modest 4 in. plate, as on many of the new tanks, but in all cases terrific impact must be withstood. Usually armor plate is deeply surface hardened by carburization. Tanks are largely constructed by joining sections of armor plate with angles.

The United States is well equipped with iron ore resources, transportation facilities and steel-producing facilities, hence steel need not be considered a strategic metal. Present steel production capacity is about 85,000,000 short tons or about half of the world capacity. Recent construction of new electric steel furnaces has given what appears to be ample producing capacity for the highest grades of alloy steels.

Manganese

The big use for manganese, and unfortunately one for which no substitute has been found, is as a "conditioner" for practically all common steels (to control the sulfur and oxygen contents). Thus, the low carbon steel used in making automobile bodies, tinplate, and galvanizing stock contains 0.3 to 0.6 per cent. manganese, while up to 0.9 per cent. is added in various higher carbon and alloy steels. It is used, also, as an alloying element in manganese steels and in making the very tough, abrasion resistant austenitic or Hadfield's manganese steel. The latter contains over ten per cent. manganese. It is used particularly as castings in parts which receive severe abrasive wear and impact, as railway switches and crossings, power shovel and dredge bucket teeth or lips, conveyor chain, gears, sprockets and tractor shoes. Other materials can be used for these applications, but in tonnage steels manganese appears to be indispensable.



Above, patrol bombers of the Navy in flight.
(Official U. S. Navy Photo)
Courtesy, *Metals & Alloys.*

Above, a 155 mm. gun on the road.
(Photo by U. S. Army Signal Corps.)
Courtesy, *Metals & Alloys.*

Heavy reserves have been accumulated recently, estimated at well above a million tons of 48 per cent. ferro-manganese, or about a year's supply at maximum steel production capacity. These private stocks, plus the gradually increasing holdings of the Metal Reserve Company, and increasing production from domestic ores, make the manganese situation appear reasonably satisfactory. Domestic ores are plentiful but most of these are too low grade for economical production under normal conditions. Imports of manganese in 1939, in order of their importance were from the African Gold Coast, Russia, Cuba, India, and Brazil.

Nickel

This is one of the most important raw materials for armament production, particularly for making nickel steels. Aside from its use in armor plate and other strictly ordnance work, as has been mentioned, it is used with chromium to make austenitic stainless steel and electrical resistor and heat resisting alloys, with copper for Monel and the cupro-nickel alloys, with copper and zinc to form the nickel silvers—to mention only a few of its most important useful alloys. Cupronickel of about 30 per cent. nickel content is much used in both the cast and wrought (extruded) form for salt water lines, marine condensers and various seaboard applications.

Stainless steel, as the 18 chromium—8 nickel type, is used not only for numerous applications in armament work, such as in making instruments, gun recoil mechanisms, and wherever high strength plus corrosion resistance is needed, but indirectly for equipment used in producing explosives, motor fuels, chemicals, foodstuffs, etc. It is also considered to have possibilities in aircraft manufacture. Production of improved stainless clad steel may help materially to furnish the desired non-corrosive surface without making the demand on nickel and chromium that solid stainless requires.

The present curtailment in the use of nickel for purposes other than those applications associated with armament production is due to demand outstripping production capacity rather than to any shortage in ore resources. About 85 per cent. of the world's production comes from Canada. Canadian and British needs naturally receive first consideration. The initial stringency in this country may not last long but substitutes are being sought. Other alloy steels are supplanting some of the nickel steels; copper may be used in place of nickel in high strength cast iron. As an undercoating for chromium plating, less nickel can be used, or it may be replaced entirely by white bronze, an alloy of copper and tin.

Chromium

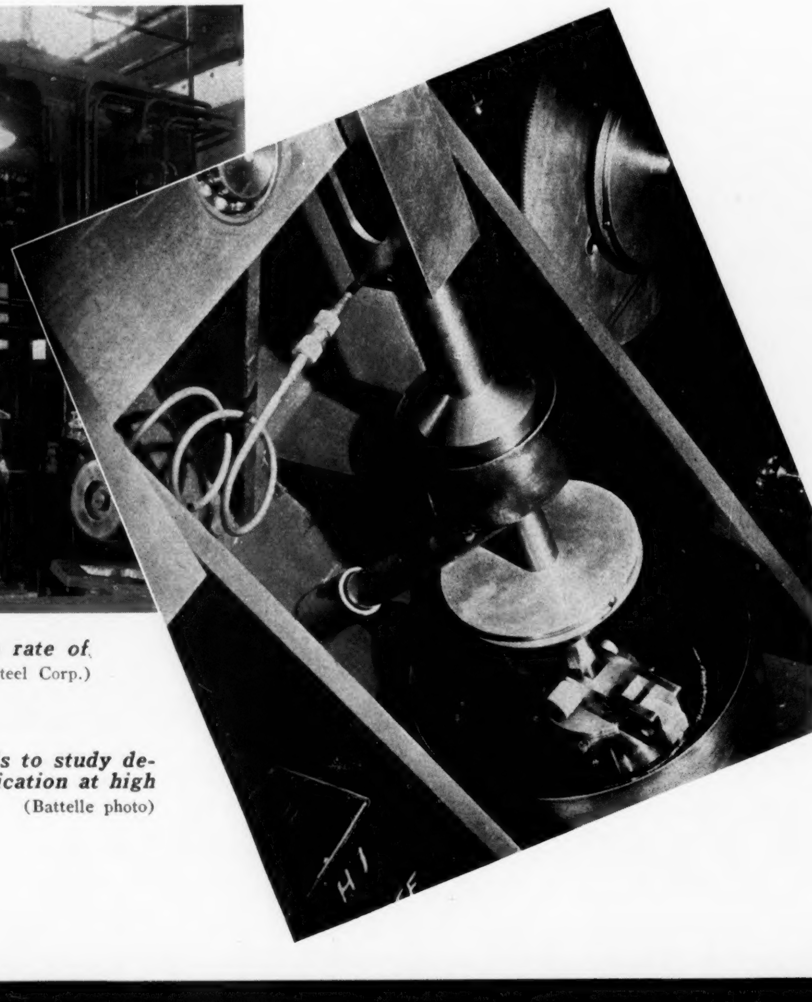
Because of large imports and extensive use for armaments as well as peacetime uses, chromium stands high on the list of strategic metals. It is difficult to find substitutes for many of the high chromium alloys, such as those with nickel or with nickel and iron in making corrosion resisting, heat resisting and electrical resistor alloys. A smaller percentage of chromium is used in wear resistant steels, with nickel in making armor plate, and in high-speed steel (4% chromium) with tungsten or molybdenum. With molybdenum, chromium is used in steel for oil refining, power generation and similar work at elevated temperatures, or for high strength structural parts, such as airplane framework. The pure metal is used in chromium plating, an application which can be omitted in many applications when beautification is the chief purpose.

Most of our present supply of chromium has been imported as chromite from Southern Rhodesia, South Africa, Cuba, Philippine Islands, New Caledonia, and Turkey, in this order of importance. Up to 1940 domestic mines produced less than one per cent. of the chromite consumed. New methods have been devised recently for utilizing low-grade ores, however, hence this situation may be quite temporary. In the meanwhile, heavy stocks of chromite are on hand.

Molybdenum, Tungsten and Cobalt

Since about 92 per cent. of the world's production of molybdenum comes from this country and ample ore resources assure a plentiful supply, this metal is not only being used as a well recognized constituent in many alloy steels, but is available as a substitute wherever possible to use it. Molybdenum high-speed tool steel, or a high carbon steel containing about 9 per cent. molybdenum, 4 per cent. chromium, 1.5 per cent. tungsten, 1 to 2 per cent. vanadium and (for some pur-

Above, cold rolling steel strip is produced at the rate of 700 to 800 feet per minute. (Wheeling Steel Corp.)



Right, testing bearing metals to study departure from fluid film lubrication at high loads. (Battelle photo)

poses) 5 per cent. cobalt, for example, can be used in place of tungsten high-speed tool steel, containing up to 20 per cent. tungsten. High-speed tool steels, of course, are extremely important in munitions manufacture and for a great many machining operations. Since molybdenum can be used as the oxide, smelting facilities are unnecessary. This simplifies production requirements.

Aside from its use in high-speed tool steel, which takes about 80 per cent. of the tungsten used at present, tungsten is used in die steels as for die casting aluminum, magnesium and brass in armor piercing projectiles, and in some tool steels. It is particularly used in machining operations in the form of tungsten carbide cutting tools, and, of course, is practically irreplaceable at present in lamp filaments. Fortunately, there are not only substitutes for some of the present uses of tungsten and large stocks available, but ore resources in this country have been developed to the point where the United States is nearly self-sufficient. Supplies are also available from Bolivia and Argentina. Dependence on Chinese ore is no longer necessary.

Cobalt is included in this group because it is essential as a binder in sintered carbide tools, and is used in special cobalt high-speed steels which are adapted to cutting heat-treated steels, cast iron, sand castings and similar hard, gritty materials. A special use is as an alloying constituent in some of the modern magnets, including those used in some aircraft magnetos. Cobalt used in this country has been largely imported. At present it is scarce but increased production in Canada and some projected domestic production is expected to relieve the situation somewhat.

Aluminum and Magnesium

The great demand recently for aircraft has placed both aluminum and magnesium on the scarce list. This is due to the inability of producing capacity to keep up with unprecedented demand, rather than to any shortage in raw materials. Cryolite can be imported from Greenland or made synthetically, and Bauxite is produced in Arkansas and imported from Dutch Guiana. The production of magnesium from Michigan salt brines is being supplemented by recovery from sea water.

Aluminum and its alloys are used wherever lightness is a dominating factor, as well as for many applications where its appearance, resistance to corrosion and non-toxicity are considerations. Magnesium and its alloys are the only feasible substitutes, unless thinner sections of stronger alloys can be used to at least partially compensate for greater weight. Where lightness is of secondary importance, as for kitchen utensils, dairy and food handling equipment, substitutes are readily found. Thus, tinned equipment, enameled ware, and—in some cases—plastics may serve. One of the interesting present applications of aluminum in munitions is the use of the powdered metal in incendiary bombs.

For enhanced strength and to meet specific mechanical requirements, aluminum is alloyed with one or more of the following: copper, silicon, magnesium, manganese, iron and zinc. The strength of many of these alloys is further enhanced by heat treatment. Castings of such alloys are much used in defense work, particularly for aircraft engine parts and fittings; heat-treated alloy sheets, such as the well-known aluminum-copper-magnesium-manganese alloy, Duralumin, are widely used for sheathing.

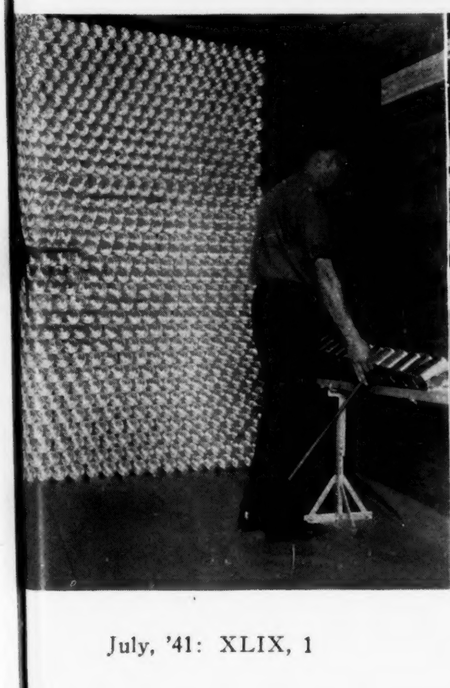
Bruce W. Gonser

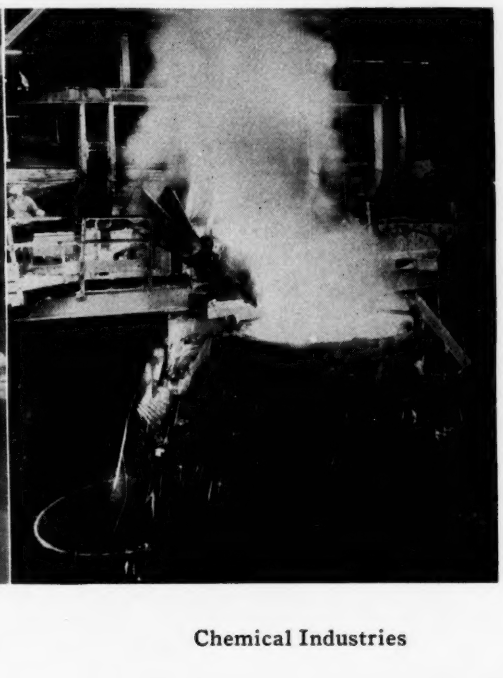
Magnesium is used in the pure form as powder for flares, and in wire, ribbon and extruded shapes. For much needed strength, however, it is usually alloyed with 4 to 10 per cent. aluminum, 0.2 to 0.3 per cent. manganese, and, in some alloys, with up to 3 per cent. zinc. Die castings, sand castings, extruded rod and rolled sheet are the forms most used. The castings go into aircraft parts such as motor castings, oil pumps, accessory gear housings, starting equipment, instrument housings and landing wheels. There are also many non-aircraft applications where lightness in moving parts favors the use of magnesium.

Copper and Zinc

These metals may be considered together since brass is an important munitions material. Yellow brass, 70 per cent. copper—30 per cent. zinc, is much used for cartridge cases; gilding metal, 90 per cent. copper—10 per cent. zinc, is used to make the rotating bands on bullet jackets. In marine equipment the brasses (and bronzes) are extensively used because of their corrosion resistance to sea water and sea atmosphere. Gun metal, 88 per cent. copper—8 or 10 per cent. tin—4 or 2 per cent. zinc, and other copper-tin cast bronzes of varying composition are much used in pipe fittings, gears, valves, pump pistons, bearings, bushings, and structural work requiring corrosion resistance plus strength. Other copper base alloys of particular importance in defense work include the very strong aluminum bronzes, used in making gun mounts, propellers, pump parts and heavy machine gears; the strong, corrosion resisting silicon bronzes; the exceptionally hard, heat-treatable beryllium-copper alloys, used in such applications as non-sparking tools, springs, diaphragms, and gears; and copper nickel

Below, left, tin cans require about 40,000 tons of tin per year, or over half the total used. Right, Inland Steel photo showing pouring of steel from open-hearth. Note size of receptacle compared to size of man on ramp.





alloys. Of even greater importance than its alloys, however, is the use of pure copper or slightly alloyed copper in all kinds of electrical equipment.

The chief applications of metallic zinc, other than in brass, are as a protective coating for steel in galvanized equipment, and as zinc die castings. The former finds many applications in ordnance, and in the construction of army and navy buildings and air raid shelters. Because of excellent mechanical properties and high rate of production, zinc die castings are used for a vast variety of products, particularly for such automotive parts as carburetors, fuel pumps, instrument frames, hardware, and for small motor frames.

The demand for zinc has recently entirely outstripped production, plus stocks, hence it is temporarily on the scarce list, although ores are plentiful. The tremendous copper producing capacity of the United States is being strained somewhat to keep up with demand, but with some assistance from South American producers no real shortage appears to be imminent.

Tin

All the tin used in the United States is imported. It comes largely from southeastern Asia and, until recently from smelters in England. A smelter being erected in Texas to use South American ores, and possibly some from the Netherlands East Indies, may eventually furnish a quarter of the country's present requirement, but the main dependence must be placed on stocks and substitutes if transportation lines to southeastern Asia are cut. Fortunately, heavy stocks are being accumulated rapidly and various substitutes can be used, if essential to do so. At present tin is actually being used as a substitute for aluminum and nickel in some applications, but it is still to be regarded as an important strategic metal.

The largest use of tin in making tinplate, the raw material for tin cans. This, of course, is of direct concern to the Quartermaster Corps, as well as to the canning industry. There is little chance of decreasing the present 0.00007 in. hot dipped tin coating by more than a few per cent., but by electrodeposition some saving in tin can be effected by securing a more uniform coating. The use of untinned containers with welded side seams, or stamped, seamless construction, and a lacquer lining (applied after forming, as with beer cans) has been suggested for use in packing dry materials and some non-corrosive products. Also, the increased use of terne plate, a lead-tin alloy, for non-food products and the increased use of glass and fibre containers are possibilities as substitutes.

From the standpoint of armament manufacture, tin is of most value in making soft solder, bearing linings, bronzes, and for hot tinning various materials. Applications in making collapsible tubes, foil, and miscellaneous uses are less important common applications. Tin-lead soft solder is used in making electrical connections of all sorts, in automotive radiator manufacture and for joining a vast variety of miscellaneous parts where high strength is not essential. Other methods of joining parts—as welding, brazing, use of silver solders, cadmium solders and lead-silver solders—are available if substitutes become necessary. Tin base bearing linings, containing 3½ to 8 per cent. of both copper and antimony, are widely used wherever machinery is in operation, although substitutes can be used for most applications.

Lead and Antimony

These metals are both plentiful, with no prospect of a shortage. The former comes from domestic ores; much of our antimony is smelted in Texas from Mexican ores, and the remainder comes from South American sources. In 1914-1918, a great deal of antimonial lead was used in making shrapnel, but this is only a minor application now. The chief value of lead and antimony in armaments at present is in making wet battery plates for motorized equipment, field communication equipment, and other applications where a portable source of electricity is needed. Lead containing 0.1 per cent. calcium may be used in place of antimonial lead for this purpose. Among other substitutions, hard lead die castings are being used for some zinc die castings where high strength is not essential. Lead containing 5 per cent. silver is used as solder in making radiators for liquid colored air craft motors, and a cheaper solder having only two and one half per cent. silver with 0.25 per cent. copper has been suggested for use as a general soft solder if tin becomes unobtainable. A very small amount of lead added to steel improves machinability, resulting in greatly enhanced speed of production of many products used in defense work.

Precious Metals

The usefulness of our gold and silver supply is open to some doubt; at least most metallurgists would be glad to see at least half the supply traded for some heavy stocks of really usable metals, like nickel, tin, and chromium. Silver solders and electrical contact points using silver or silver-tungsten mixtures are worthy of mention. Platinum, palladium and gold have few metallurgical applications related to defense, except for utensils or tank linings where their excellent resistance to corrosion is valuable. Its extensive use as a catalyst is probably responsible for the presence of platinum on the strategic list.

Minor Metals

Mercury is usually listed as an important strategic material, but this is due to applications of its compounds in munitions manufacture rather than to important metallurgical uses. United States production is being kept in balance, even with the greatly increased need for it.

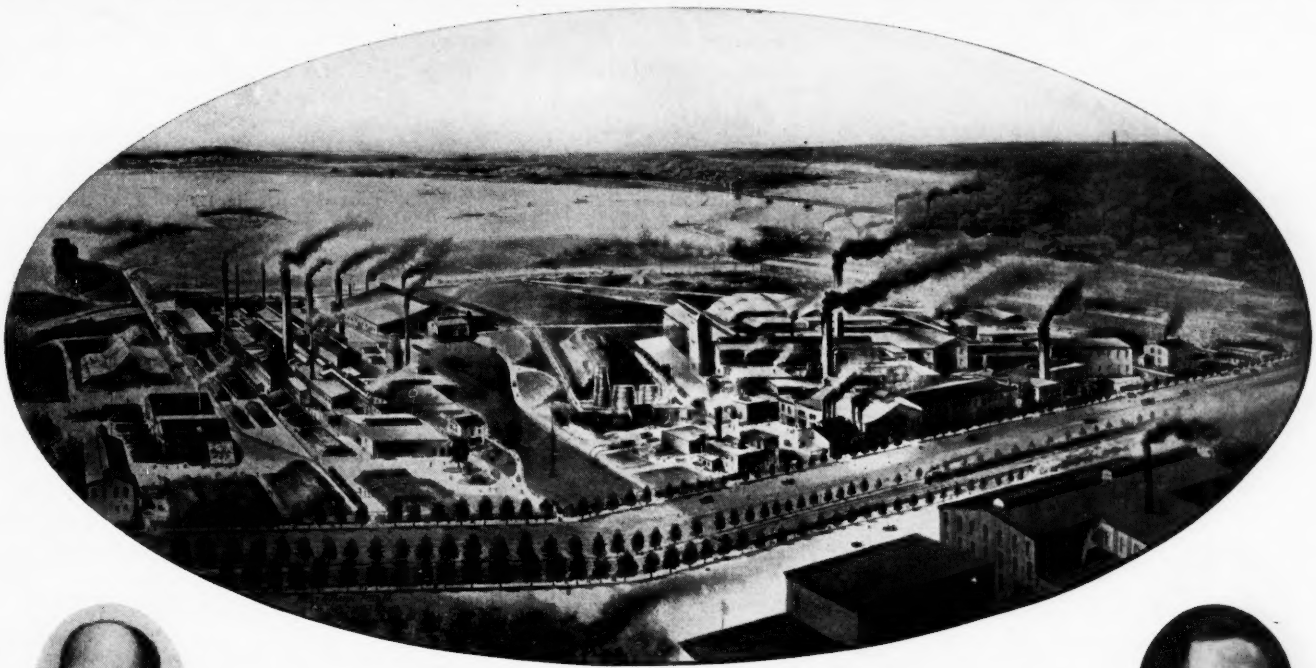
Vanadium is used as an important addition to many tool steels, and as a minor element in various alloy steels. Tantalum is used metallurgically as the pure metal for applications in contact with hydrochloric acid, and as the sintered carbide for machining tools. Titanium, with tungsten also forms a valuable ultrahard carbide for cutting tools, valve seats and wearing surfaces. Columbium is used to stabilize stainless steel during welding. Cadmium finds applications in some defense work as a protective plating over steel, as an alloying constituent with copper for greater strength without greatly reducing electrical conductivity, and to a limited extent with a little nickel or with copper and silver to form bearing linings.

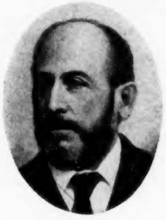
A sharp distinction cannot be drawn between metals and alloys for defense and those for peaceful applications. Since machinery of all kinds now plays such an important part in warfare, rapid transportation, uninterrupted communications, adequate power supplies, and good tools become just as important as guns, bombs and battleships. Many metals and alloys are vital for all these purposes, and we are singularly fortunate in the United States that so few of them must be imported.

Below, firing .50 calibre anti-aircraft machine gun during practice maneuvers.

(Photo by U. S. Army Signal Corps.) Courtesy, *Metals & Alloys.*

"CHEMICAL PIONEERS"





Henry Bower

George R. Bower

The Bowers of Philadelphia

By Williams Haynes

LATE in the autumn of 1825 a mysterious stranger arrived in Philadelphia. This was the year of the first Prussian putsch that swallowed up the Free City of Hamburg by a technique which has since been highly perfected. The newcomer was a political refugee from that ancient, independent trading center.

He brought with him practical experience as an international merchant; a comfortable sum of working capital; and an abiding bitterness against all things German.

Promptly he set himself up as an importer of satins and brocades from France and Russia. From the very outset his business was exceedingly profitable. Because he soon found that "Wilhelm Bauer" was invariably mistaken for a German he forthwith changed his name to William Bower.

He was a personable young man, small of stature, but wiry with finely chiselled features, clear blue eyes and wavy brown hair. He was well educated, intelligent, of easy manner with just a touch of continental formality that was attractive to the Quaker conservatives of Philadelphia's foremost families. He made friends quickly.

William Bower was reticent. He talked little about himself and inquiries about his past he parried, pleasantly enough but quite definitely. Hence the worthy gossips naturally began spinning an adventurous and romantic background for him. In this way there was thrown about him an atmosphere of mystery that clung to him throughout life.

In one Philadelphia household, however, his true story was known. Six years before William Bower came to America, another Hamburg citizen, Jacob Bennet, had brought his family to Philadelphia. Both he and his wife came of old Hamburg stock, and they must have known that young William Bower was a descendant of a family which had been prominent in their native city since the Sixteenth Century, particularly famous in that great world market for their dealings with the Levant, the Wine Islands, Spain, and Portugal. They may even have known what his own

children only learned from his papers after his death that as a young man he had travelled extensively over Europe, especially in France and Russia, engaged in trade in all sorts of drugs, spices, dyewoods, metals, and textile fibres.

In his strong box was found a yellowing price list, "dated St. Petersburgh, 23 Mar. 1820" printed in old Danish, from which we learn that although the great cold of that winter would delay the opening of navigation his agent in the Russian capital, Gustaf Herkel, decided to mail to his customers his regular market letter, reporting conditions on all sorts of commodities from hemp and hides to rum and sugar. His comments on two chemicals reveal curiously how little the style of the market reporter has changed in one hundred and twenty years:

"Potash—Sales of carryover stocks from last year have reduced supply here to 7,000 casks of inferior quality, but in view of better prices which have been paid for some time it is estimated that exports next summer may be figured at close to 15,000 casks.

Alum—Through forced sales of Swedish alum at 75-76 rubles stocks here have been reduced to 1,500 barrels. With this carryover further supplies can hardly be expected inasmuch as the new permits to import all sorts of goods will naturally reduce the activities of Russian factories and as a result curtail the incoming supplies of Alum." All of which give us a vivid glimpse of the kind of business that the House of Bauer did, and what kind of business experience young William brought to America.

It was natural that young Bower should have been made welcome in the Bennet household, and as was not unnatural, fell in love with one of the pretty Bennet daughters. He married Fanny Bennet in 1826, a few months after her sister Elizabeth had married a rising young chemical manufacturer, George D. Rosengarten, who the year before had become sole proprietor of the firm established by Seitler and Zeitler. Years later this close and friendly family tie with the Rosengartens brought William Bower's son Henry into the chemical industry.

However roving and romantic William Bower's life in Europe may have been, in America it was quite simple. Likely he had had his fill of travel and adventure, for after a few prosperous years as a silk importer he retired to a farm on the Pennsylvania bank of the Delaware River, at Pomona, in Bucks County, a few miles above Trenton. Ten years later he sold this farm and bought three hundred rich, rolling acres near Newark, Delaware. Here he built a fine brick house, which still stands, engaged a competent tenant farmer, and settled down thoroughly to enjoy the leisurely, cultivated life of a country gentleman. Here, too, he died and was buried in the beautiful little Presbyterian cemetery at the head of Christianna Creek.

An early photograph of the Henry Bower Chemical Manufacturing Company at Gray's Ferry Road, Philadelphia. Opposite page an early bird's-eye sketch that required over six months of the artist's entire time to complete.

In this day and age of uncertain labor relations in industry, of National Relations Board, of strife between branches of labor it is interesting to read this testimonial, a highly prized possession of the Henry Bower Chemical Manufacturing Company.

He left seven children, two sons and five daughters. The eldest was a boy, Mitchell (the second Rosengarten son was also christened Mitchell); next a daughter, Elizabeth, named doubtless after her aunt, Mrs. Rosengarten; then the son Henry, followed by Georgianna, Juliana, Emma, and Annie.

The second son, Henry, whose activities years later resulted in the formation of the present Henry Bower Chemical Manufacturing Company, was born in Philadelphia, April 9, 1833, while his father was still actively engaged in business. By the time he was ready for school the family had moved to the Pomona farm and he was thoroughly, if reluctantly, educated by the estimable Dr. Taylor in his academy at Trenton. For it is remembered that he was a high-spirited youth, fond of games and full of pranks, who did not take seriously to study until his interest was truly aroused in chemistry at the Philadelphia College of Pharmacy.

We may suspect that as a boy young Henry was quite a family problem, and we know that he studied pharmacy at his uncle George Rosengarten's suggestion, and that during his college years he lived in Philadelphia with the Rosengarten family. How skillfully the older man must have nursed his nephew's interest in chemistry, encouraging his studies, pointing out a fascinating and important life-work in the manufacture of chemicals. The intimate relationships they established during those years lasted throughout life and to the family bond was later forged a strong common business interest. How greatly the enthusiastic boy rose to the opportunities pointed out to him, is amply demonstrated by the story that when he came to write his graduation thesis on castor oil, he nearly killed himself by an over-dose taken to secure first-hand data.

While studying at the College of Pharmacy, Henry Bower worked in the wholesale and retail drug store

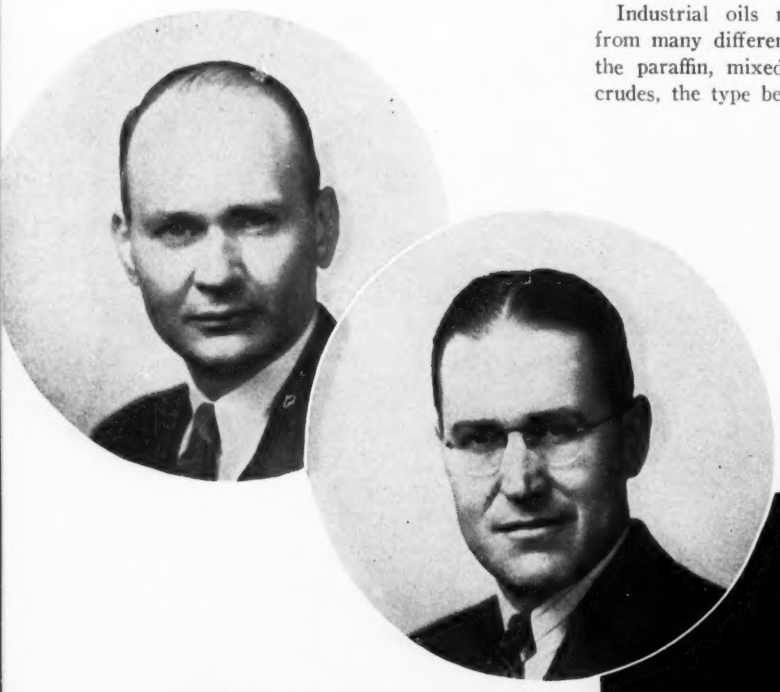
(*Continued on page 95*)

PETROLEUM PRODUCTS

In Industrial and Process Oils

By J. C. Zimmer
and
E. W. Carlson
Esso Laboratories

This feature article points out that the outlook on availability of petroleum products should cause no particular concern to the consuming industry in the United States. The authors are particularly well-qualified to tell why.



PETROLEUM products, exclusive of fuels are essential for the smooth functioning of practically every industrial operation. The immediate and long-range outlook indicates that the supply of these products should be sufficient to meet current and probable future domestic requirements. Thus, the outlook on availability should cause no particular concern to the consuming industry.

Industry's requirements for petroleum oils are great not only in volume, but also in the variety and range of products. They serve as lubricants for its prime movers, its power and material transportation systems, and all the diverse machinery employed in manufacturing operations. In almost equal volume, but greater variety, such oils are also used in the processing of industry's raw materials and finished products, where lubrication of moving parts is not a factor.

This latter class of petroleum products, generally termed process oils, includes numerous specialty oils used in the manufacture of many of industry's products. For example, in the machine shop they range from the dust absorptive agent in the floor-sweeping compound to the cutting fluid used on the lathe, and the rust preventive applied as a preservative on the finished article. Frequently, the process oil not only aids in processing, but also constitutes an ingredient of the finished product, as, for example, in printing inks, leathers, insulating felts, or special rubber compounds.

Industrial oils may be manufactured from many different crude oils including the paraffin, mixed base and naphthenic crudes, the type being determined by the characteristics required for the particular service. The greater proportion of the industrial oils are obtained from the lubricating oil distillates from topped crude oil from which the gasoline and gas or fuel oils have been previously removed. The residual oil or so-called steam refined stocks remaining after distilling off the more volatile lubricant fractions serve as the base stock for the heavy or more viscous products, such as gear oils and steam engine lubricants. In some cases the unrefined raw lubricating oil distillates themselves are used, as for the lubrication of rough machinery construction equipment, etc. Most of the industrial oils like motor oils, however, require additional refinement by chemical treatment or solvent extraction to assure cleanliness, chemical stability, non-corrosiveness, etc. The extent of this refinement ranges from simple neutralization and redistillation to the production of white oils of medicinal quality for the lubrication of food processing equipment where the highest purity is essential.

A brief schematic outline of the more important types of industrial oils is given in Figure 1. Ths figure also points out several of the more common types of additive or compounding agents that are used in industrial lubricants. The compounding agents are used in many cases

To the left, the authors, J. C. Zimmer (upper left) and E. W. Carlson. Below, the Bayway Refinery of the Standard Oil Co. of N. J., pictured at night.

to increase stability, lubricity or load carrying capacity and in others to regulate lubricant consumption, as in the case of the soaps. They may also perform functions which are not so obvious, for example, fatty oils in addition to increasing lubricity may serve to form emulsions with contaminating moisture, thus preventing the lubricant film from being ruptured or washed off. This characteristic of fatty oil blends is made use of in marine oils and lubricants for compressors handling moisture contaminated gases or steam engines operating on wet steam.

In certain cases, lubricating ability may be only a secondary consideration and other qualities such as stability against acid and sludge formation are paramount. Turbine oils, which serve principally as coolants, offer an excellent example of such oils as well as testimony to the accomplishments of the chemist in this field. They must show exceptional resistance toward oxidation and the formation of sludge which would retard heat transfer and in addition they should separate contamination moisture rapidly, and act as a corrosion preventive to avoid fouling heat transfer surfaces. In order to attain this ideal, manufacturers have resorted to greater care in the refinement of turbine oil stocks, and the chemists have devoted considerable research to the problem of oxidation resistance. The studies have resulted in the development of oils of very superior quality when combined with certain types of antioxidants or inhibitors, some examples of which are listed in Table I next column:

Below, indicative of the uses for industrial oils is this steel mill scene showing a rolling operation. These mills now operate at capacity levels.

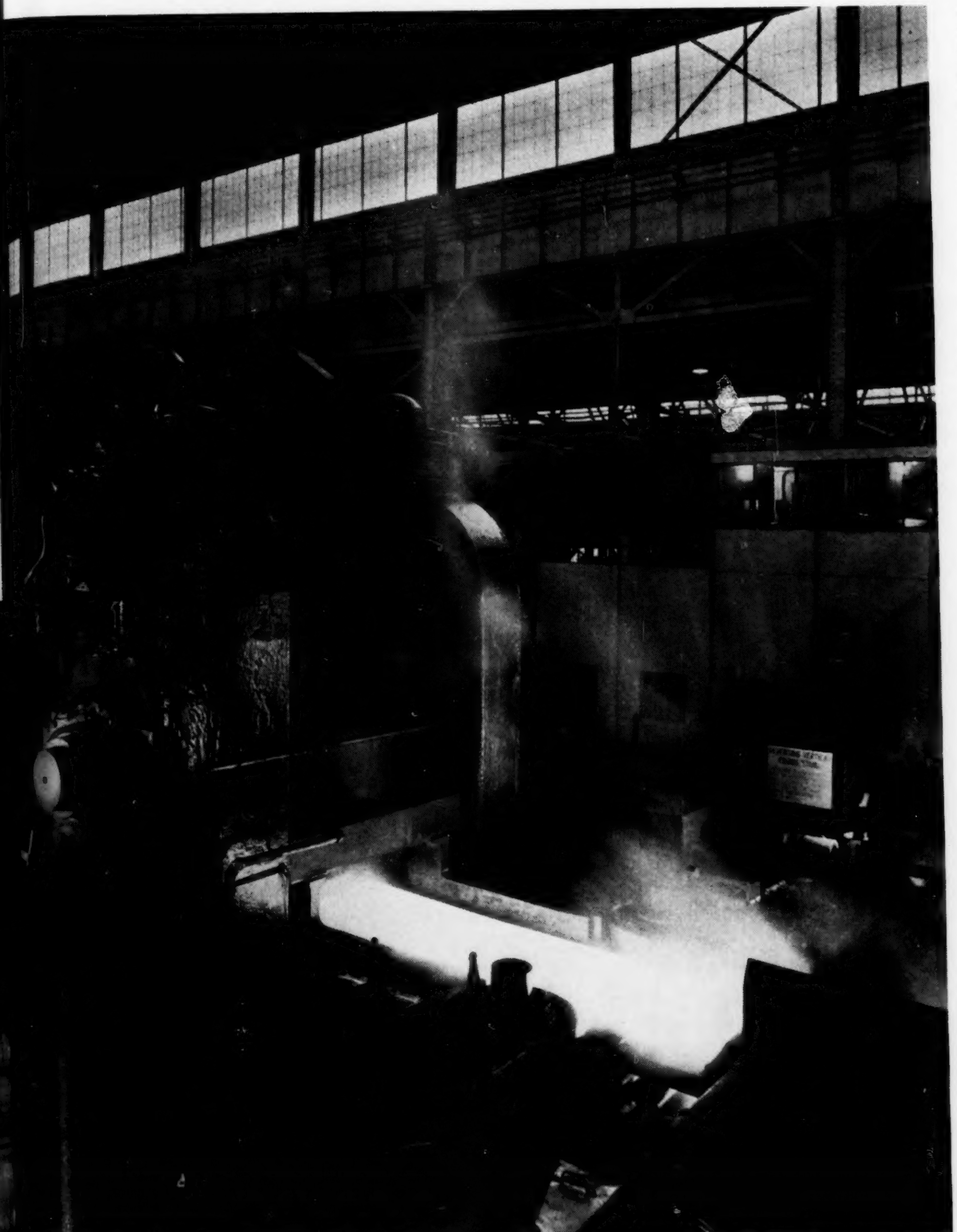


Table I

Patents on Lubricating Oil Stabilizers

U. S. 1,793,134	Naphthols
U. S. 1,856,186	Aromatic Nitriles
U. S. 1,888,023	Aliphatic Amines
U. S. 2,031,930	Tertiary Alkyl Phenols and Cresols
U. S. 2,134,435	Alkyl Thio Ethers of Nitro Aromatics
U. S. 2,139,766	Dialkyl Aromatic Sulfides
U. S. 2,167,273	Non-Symmetric Diaryl Amines

The development of improved lubricants is greatly facilitated by accelerated laboratory tests simulating service conditions, since the useful service lives of products such as some of the modern stabilized turbine oils are now measured in years. Service tests alone would unduly delay conclusions and might also seriously jeopardize expensive equipment with unproven, experimental products. Accelerated laboratory tests using turbine construction metals such as steel and copper as oxidation catalysts with or without forced aeration and moisture contamination of the oil, such as the Funk, Modified Indiana and Brown Boveri tests (1, 2, 3,) are used by both manufacturers and consumers of turbine oils to predict lubricant performance. Results of such tests when carefully weighed and interpreted show reasonably good correlation with service data. Figure 2a compares laboratory test and Figure 2b compares service results on a typical, older type, uninhibited oil which had begun to develop acidity after 6000 hours' usage in comparison with a modern stabilized product which showed no appreciable change during 24,000 hours' operation.

Industry has many other applications requiring oils of the highest degree of stability to insure trouble-free, uninterrupted service for extended periods. Among these are the electrical insulating oils for transformers, cables, and switches or controllers, and numerous examples of enclosed bath lubrication, such as textile spindles, electrical motors, gear and hydraulic power transmitting systems, compressors, refrigerator units, etc.

The service requirements for general machinery and bearing oils are normally less severe, with the result that the less costly and less thoroughly refined industrial oils are generally employed, particularly where the lubricant is not recirculated, or where leakage results in rapid consumption. In many cases where lower consumption is desired, soap-thickened semi-fluid oils and solid greases are employed. A need for less possibility of product contamination, better sealing of the bearing to prevent entrance of dirt and more compact machinery construction, with longer intervals permissible between replenishment of lubricant, are additional reasons for the frequent use of non-fluid lubricants.

Semi-fluid oils and greases are prepared by the addition of calcium, soda and aluminum soaps to mineral oils. The

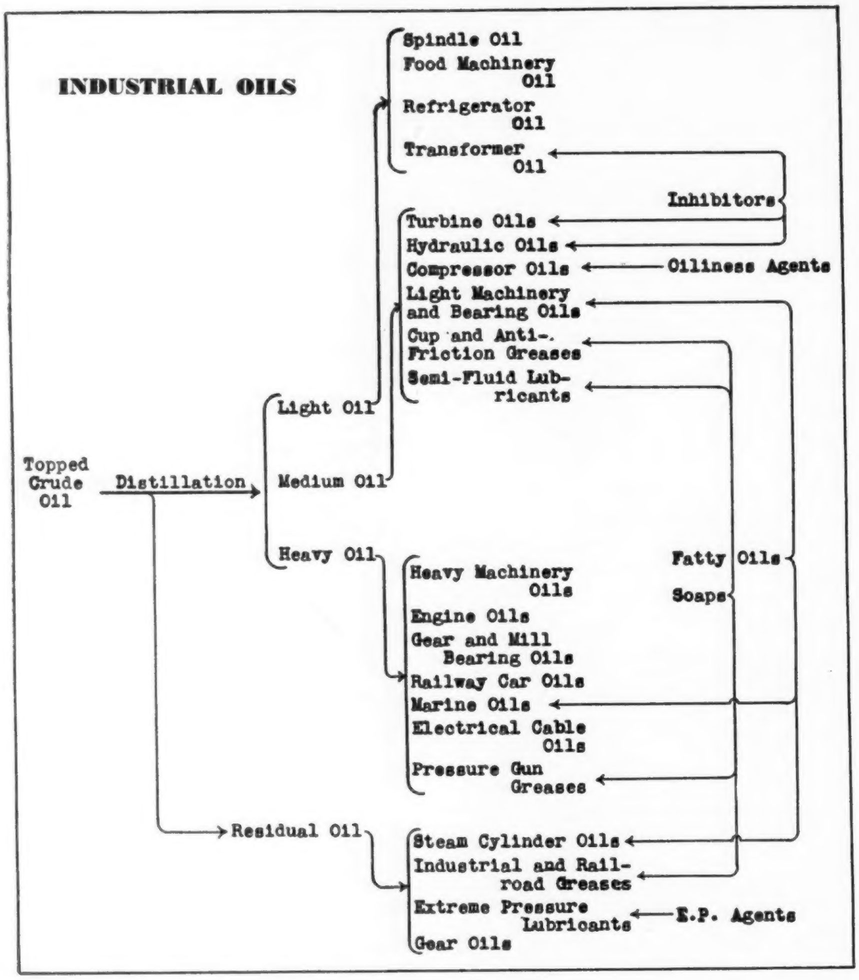


Figure 1, showing a brief schematic outline of the more important types of industrial oils. Also pointed out are several of the more common types of additive or compounding agents used in industrial lubricants at this time.

quantity of soap used is determined by the consistency desired in the lubricant and may range from a few per cent in "bodied" oils up to 50 per cent in the high melting point, block greases used to lubricate kiln trunnion bearings and the driving journals of locomotives. The manufacture of calcium and soda greases consists of the saponification of the fat or fatty acids with the respective alkali followed by dilution of the soap concentrate with oil to the desired consistency. Aluminum greases are manufactured by dissolving aluminum soap in the oil vehicle and cooling. The processes are batch operations and, while at first glance they appear quite simple, in practice, they involve all the complexities of soap boiling and the intricacies of colloid chemistry where mechanical and heat treatment and the presence of mere traces of some types of constituents play most important roles. Ingredient characteristics and proportion, the temperature of cooking and cooling, and degree of agitation must be carefully controlled and duplicated from batch to batch to maintain uniform structure, consistency and insure stability.

Greases perform their lubricating functions mainly through their ability to adapt themselves to bearing clearances and speeds by large changes in viscosity with varying rates of shear. Greases are plastic solids with an appreciable yield value. Under low shearing stresses they do not flow, and consequently will not run out or drip from a bearing. Under heavy loads between the moving surfaces of a bearing, however, they soften and flow quite readily, and under the extreme shearing stress of a close-fit, high-speed bearing, their viscosity may actually closely approach that of the mineral oil base. Greases, accordingly, are prepared with a wide range of base oil viscosities to adapt them to bearing construction and operating conditions. Other characteristics which affect the choice of a grease for a given service are the water insolubility of calcium or cup greases and the high melting points of soda soap products. The latter, in addition to high temperature service, are used for anti-friction bearings, although for this purpose the characteristics of calcium and soda greases are also frequently combined by incorporating both soaps into the grease.

The high soap content, block greases serve their purpose by incipient melting or the release of a thin film of relatively liquid, soap-oil solution on the surface in contact with a journal. Block grease formulation and manufacture thus involve securing a balance between too rapid liquefication and consumption and adequate lubrication without premature grease failure through glazing and carbonization of the bearing contact surfaces.

The adhesive semi-fluid lime and aluminum greases serve to bridge the gap between oils and solid greases in applications where bearing clearance, machine construction or other requirements preclude the use of the latter. Saw and planing mills, coal mining machinery, steel mill roll-out tables, overhead traveling cranes, track and conveyor rollers, and textile looms, are examples of equipment utilizing semi-fluid lubricants. Textile loom bearings may be cited as a special case for which lubricants have been developed to solve operators' problems. Loom bearings of necessity operate with relatively large clearances and, while semi-fluid greases lubricate satisfactorily, splattering or throw-off means fabric stains which are difficult to scour out because of the water insolubility of the lime and aluminum soaps. To overcome these difficulties, oils have been bodied, and made adhesive or non-spattering by the addition of polybutene and similar polymers prepared from by-product refinery gases (4). If the cloth is inadvertently spotted with these adhesive or stringy lubricants, the stain scours out much more readily than in the case of soap compounded oils. In this connection, the maintenance of bearing power consumption at the level of the straight oil with appreciably decreased oil consumption by the addition of high molecular weight polybutene polymers offers interesting possibilities in general machinery oils.

The addition of fatty oil and soaps to oils for the purpose of regulating lubricant consumption also has the further advantage that the lubricity and load carrying capacity is increased. The use of the relatively fluid lead soap compounded oils in particular is an old and well established means of lubricating an overloaded bearing or gear. Oils of this type have been particularly successful on the drive and reduction gearing in steel mills, where the gears must stand heavy shock loads and are subject to rapid failure by tooth scoring and spalling when lubricated with ordinary mineral oil. These leaded oils alone, or in combination with elementary sulfur, another crude, but effective means of cooling overloaded bearings, were the forerunners of extreme pressure and hypoid lubricants which have allowed automotive manufacturers to decrease the size of their rear axle gears and practically eliminate differential gear failures even under the severest truck service.

The extreme pressure additives or

agents used for the preparation of these lubricants include lead soaps, sulfurized oils, chlorinated hydrocarbons, and various combinations of sulfur, chlorine and phosphorus compounds. The lead soaps function as cushioning agents and friction reducers, while the other agents cited are more or less chemically active and react with the gear surfaces to form extremely thin films of sulfides, chlorides or phosphates, which prevent contact of clean metal surfaces under heavy loads. Welding of the parts and resultant scoring is thus eliminated.

The choice of and proper blending of extreme pressure agents has been the subject of intensive study and service testing to secure the optimum balance of chemical activity to insure against weld scoring, while avoiding excessive chemical activity with resultant abrasion or corrosion of gear assembly metals. A few of the many patents on extreme pressure lubricants are listed in Table II and illustrate some of the types of compounds employed in formulating the products:

Table II

Patents on Extreme Pressure Agents

U. S. 197,129	Lubricating oil plus lead soap
U. S. 461,513	Sulfur-chloride treating fatty oils
U. S. 1,029,254	Lubricants containing chloronaphthalene derivatives
U. S. 1,367,428	Lubricant consisting of sulfurized fatty oil in mineral oil
U. S. 2,020,021	Lubricating oil and a thiocarbonate
U. S. 2,051,744	Halogenated hydrocarbon derivatives as extreme pressure agents
U. S. 2,110,281	Extreme pressure lubricant containing an organic disulfide
U. S. 2,124,598	Sulfo-chloro hydrocarbon as extreme pressure agent
U. S. 2,136,391	Lead naphthenate plus sulfur compounds as extreme pressure agents
U. S. 2,142,998	Petroleum or fatty oils reacted with phosphorous halides
U. S. 2,153,482	Halogenated dibenzyl disulfide as extreme pressure agent
U. S. 2,153,495	Xantho-chloro hydrocarbon as extreme pressure agent

Extreme pressure agents, particularly the lead soaps, sulfur and chlorine compounds, are also added to greases for heavy duty, roller bearing lubrication in rolling mill service. The increase in load carrying capacity obtainable by the use of extreme pressure agents has greatly increased the production life of the two to four-foot diameter roller bearings used on modern mill necks by eliminating wear and spalling of the bearing elements. In addition, the ability of these greases to absorb large amounts of water without loss of structure insures against rusting of the bearings by water which is sprayed on the hot steel billets and the rolls to regulate temperature and strip off scale. The availability of these specialized greases has been an important detail in the development of high-speed, continuous mills for the volume of production of low cost, hot and cold rolled sheet steel.

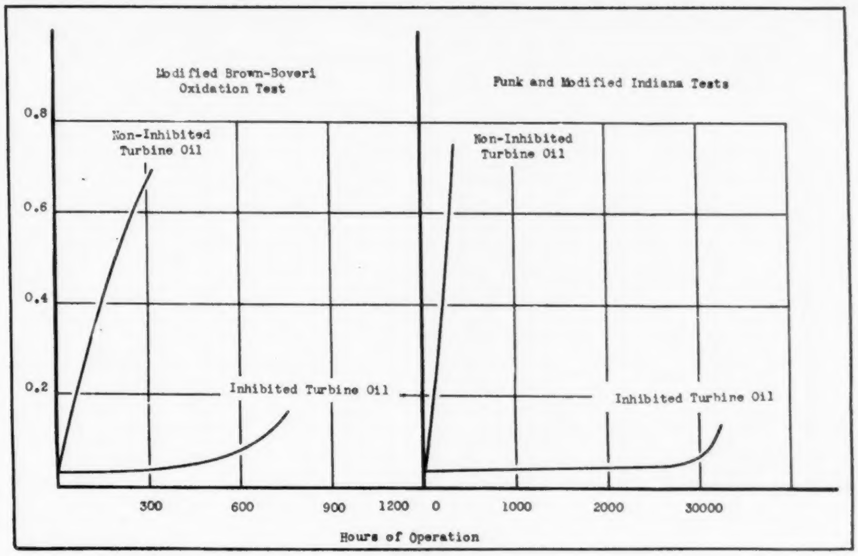


Figure 2a

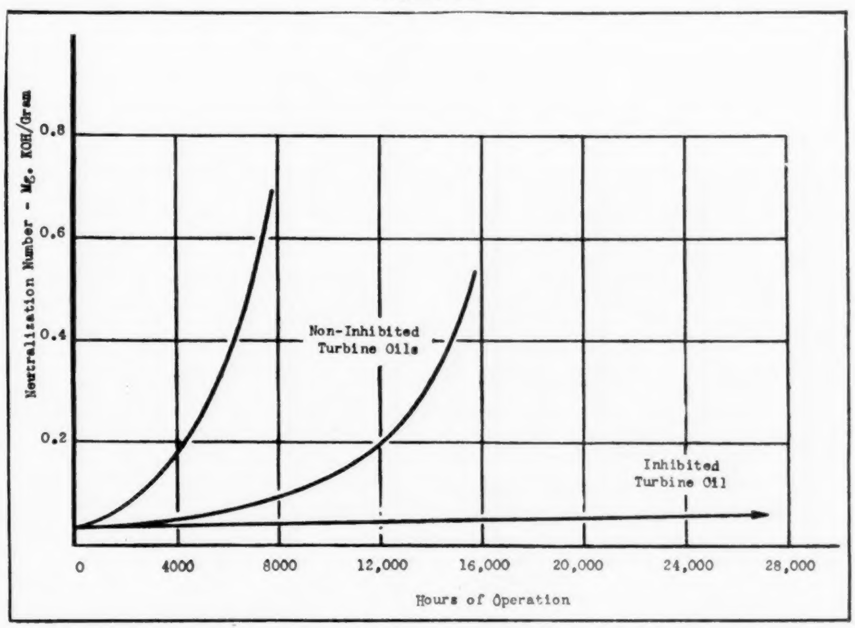
Process Oils

Process oils are used in the fabrication or processing of metal, textile, rubber, ceramic and other industrial products for other than machinery lubrication purposes, and frequently they remain as ingredients in finished goods, such as leathers, inks, insulating felts, etc. While the light mineral oils (100-200 Saybolt Vis. at 100°F) are the most widely used base stocks, practically all of the petroleum fractions from crude oils, including solvent naphthas, gas oils, waxes and petrolatums, asphalts and by-products in addition to lubricating oils, are utilized in process oil manufacture.

Process oils are best classified broadly by types. These are (1) emulsifiable oils which contain soap or other agents to facilitate mixing or emulsification with water; and (2) non-emulsifiable or straight oils, which may be further classified into uncompounded and compounded oils. Generally, individual process oils are identified by their application, for example, quenching oils, flotation oils, floor oils, orchard spray oils and coal spray oils. A number of the more common types are listed in Tables Process Oils 1, 2 and 3, which include the petroleum base, the type of applications and the customary additives employed to adapt the oils to special requirements.

The petroleum emulsifiable oils are compounded to form emulsions of the oil-in-water type without the aid of additional ingredients and are used where mixing with water is advantageous to increase heat dissipation, penetration, or uniform distribution of a relatively small quantity of oil. Usually they consist only of the lower viscosity mineral oils blended with petroleum by-product sulfonates and naphthenates as the main emulsifier constituents. The recovery and use of these

Figure 2b



Process Oils—1

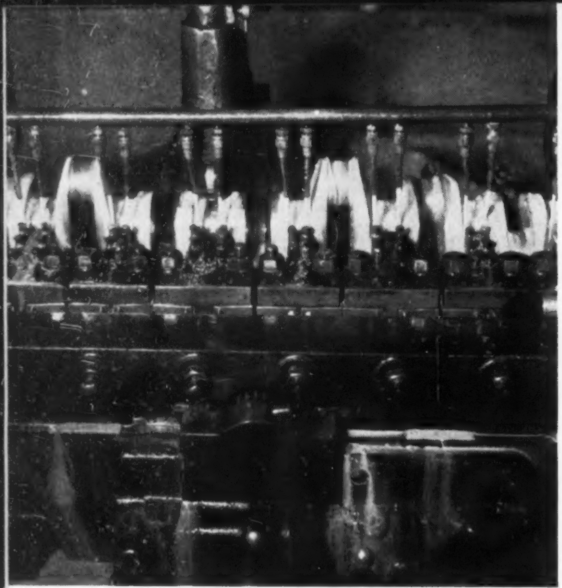
Petroleum Products	Applications	Additives
Solvents	Carriers	Toxics, Dyes, Gums
	Degreasers	Emulsifiers, Detergents
Gas Oils	Absorbent Oils	
	Flotation Oils	Emulsifiers, Frothers
White Oils	Food Preservative Oils	
	Horticultural Sprays	Emulsifiers
Light Oils	Cutting Fluids	Emulsifiers, Fatty Compounds, E. P. Agents
	Fibre Lubricants	Emulsifiers, Wetting Agents
	Mold Oils	Emulsifiers, Fatty Compounds
	Coal Spray Oils	Resins, Asphalts, Waxes

Process Oils—2

Petroleum Products	Applications	Additives
Heavy Oils	News Ink Oils	Pitches, Resins, Toners
	Quenching and Tempering Oils	Fatty Compounds
Paraffin Waxes	Paper Impregnants and Coaters	Emulsifiers, Plasticizers
	Illuminants	Stiffening Agents, Odeurs, Salts
	Polishes	Emulsifiers, Vegetable Waxes
Petrolatums	Rust Preventives	Fatty Compounds, Anti-Rust Agents
	Rubber Compounds	Fatty Compounds
	Leather Stuffings	Fatty Compounds, Fungicides

Process Oils—3

Petroleum Products	Applications	Additives
Residuals	Wood Preservatives	Toxics
	Cable Dressings	Soaps, Asphalts, Resins
Asphalts	Sealing Compositions	Resins
	Felt Impregnants	Resins, Waxes, Fatty Compounds
	Paper Laminants	Resins, Waxes, Softeners
By-Products	Emulsifiers (Sulfonates, Naphthenates)	
	Germicides (Phenols)	
	Antioxidants (Phenols)	
	Flotation Reagents (Acid Sludges)	
	Malodorants (Mercaptans)	
	E. P. Agents (Sulfur Compounds)	



Adequate supply of soluble cutting oil emulsion is directed to each tool.

soaps are described by Ellis (5). Some of the patents on sulfonates and naphthenates are listed in Table IV. Usually the straight sulfonates or naphthenates are not satisfactory emulsifiers in themselves, but are used in combination with each other.

Table IV
Representative Patents on Sulfonates and Naphthenates

U. S. 1,196,274	Recovery of Petroleum Sulfonates
U. S. 2,115,843	Recovery of Petroleum Sulfonates
U. S. 1,425,884	Purification of Sulfonates
U. S. 2,060,425	Purification of Sulfonates
U. S. 1,578,187	Soluble Cutting Oil
U. S. 1,785,451	Orchard Spray Oil
U. S. 2,079,803	Textile Oil
U. S. 1,694,280	Recovery of Naphthenates
U. S. 2,186,249	Recovery of Naphthenates
U. S. 2,056,913	Purification of Naphthenates
U. S. 2,133,765-6	Purification of Naphthenates
U. S. 1,425,884	Cutting Oils, Soaps
U. S. 1,750,134	Lubricants
U. S. 2,062,159	Pigment Dispersion

Soluble oils are particularly applicable to a number of metal processing operations. As cutting fluids they are diluted with 5 to 100 parts water to 1 part oil, and these emulsions serve mainly as coolants to dissipate the heat generated by the cutting or grinding, and to flush away chips and grind dust which may abrade the metal being fabricated, or accumulate on and dull grinding wheel surfaces. Their other functions include lubrication, which prolongs cutting tool life, and the protection of the lathes, etc., and the fabricated articles from rust formation. Both the conventional soluble oil forming milky white emulsions and the more highly compounded products forming transparent emulsions are used for these purposes. The principal reason for the use of the transparent soluble oils is to enable the operator to observe the finish of the metal and the condition of the tool without stopping the machine. Other applications where these soluble oils are used include roll oils, and as non-rusting water base hydraulic fluids.

Similar emulsifiable oils or compounds are also employed as lubricants in drawing copper and ferrous alloy tubes, rods and wire, as paper softening oils, leather fat-liquoring compounds, dormant and summer horticultural spray oils, emulsifiable solvent cleaners, or degreasing solutions, and as oil or wax preservative sprays for fruit.

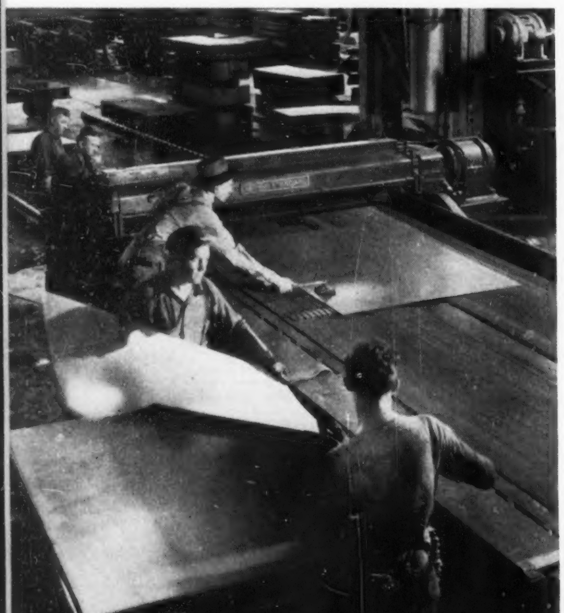
The textile industry employs large volumes of emulsifiable or fatty oil compounded mineral oils for the softening and lubrication of fibers. Fiber lubricant is particularly important in wool processing for the manufacture of clothing, upholstery, felts and carpet. The tiny scales and natural curl of the wool fiber account for the need of fiber lubrication to prevent premature interlocking or tangling and breakage during processing. The long, parallel fibers of virgin wool used for worsted goods require only some three to five per cent of oil by weight, while as much as 12 to 15 per cent of oil may be used on the shorter fibered woolen stock. The oil is usually applied to the wool stock in the form of an emulsion of 3-7 parts water to 1 part oil. After spinning and weaving the oil is removed from the fabric by scouring with soap and alkali solutions. The wool oil must, therefore, be compounded to insure easy and complete removal during scouring, since the presence of residual oil will result in uneven or spotty dyeing of the finished cloth or stains due to oil oxidation in undyed fabrics.

Emulsifiable, or so-called bast oils, are used as lubricants on hemp, jute, sisal and manila fiber to facilitate weaving. In addition, mineral oils to the extent of three to ten per cent by weight are added to cordage, since they materially increase the service life of the rope which would otherwise be cut short by internal friction. A particular requirement of oils for this service is resistance to discoloration in sunlight to prevent darkening of the treated rope, and occasionally toxic agents are added to the oil to prevent fungus or mold attack.

Oils are added to rayon and silk mainly as sizing and softening agents, since the smooth filaments of these fibers require little or no lubrication. Cotton is treated with oil only to keep down lint in the spring and weaving rooms, and is removed by the Kier boiling before further processing.

As has been pointed out, both uncompounded and compounded non-emulsifiable oils are used as process oils. In contrast

Below, rust preventive applied by roller method to steel sheet.



to the rather narrow viscosity range of oils used in the emulsifiable type, practically every petroleum product is employed in manufacturing some type of non-emulsifiable process oil and these products also account for the greater portion of the additives or compounding agents employed to impart special characteristics. These include toxic agents, antiseptics, antioxidants, anti-rust agents, fatty acids, oils and soap, sulfur compounds, extreme pressure agents, resins, pitches, vegetable waxes, etc.

Uncompounded oils are largely marketed to the specialty, ink, coal, and wood preservative trades. With the exception of the coal spray oils, the oils are compounded by the purchasers to suit their particular needs. The ink manufacturing plant adds resins and toners, in addition to pigments; and the wood treating plant a toxic agent of blends with coal tar creosote. While coal spray oils are not considered to be compounded, they may contain added petroleum wax, resin or asphalt to increase dustproofing efficiency, permanency, lustre or resistance to freezing of coal in transit and storage.

One of the principal outlets for these oils is in the metal fabricating industry. In the foundry, petroleum products are employed in core oils as well as in mold coatings and dressing compounds. In the sheet mill specially prepared roll oils, containing fatty compounds or oiliness agents, are applied to facilitate production, prevent roll pick-up or wrinkling and to improve surface finish. With copper alloys, care in avoiding sulfur compounds and other staining materials must be exercised, and frequently the volatility characteristics of the roll oil must be such that it evaporates without leaving any residue or stain during the course of bright annealing of the sheet. In other operations in the mill, petroleum base drawing and stamping compounds, containing soaps, fats, waxes, and graphite, whiting or other fillers, play an important role in tube and wire drawing, and in automotive body and fender production. In the machine shop petroleum quenching and heat treating oils are used to regulate the temper or crystalline structure of the metals; cutting fluids facilitate machining operations and petroleum base rust preventives protect the parts in process or the finished articles awaiting placement in service.

Mineral oils blended with fatty oils are employed in large volume as cutting fluids for such applications as turning, drilling and tapping. Most metals can be shaped economically only with the application of a fluid to lubricate and cool both the metal and the cutting tool, to increase the interval between tool dressings, to maintain work at finish dimensions, and to protect the work and the machine tool from corrosion. While water can flush away the chips and cool the work, it does not lubricate and protect the tool edge from abrasion, and increases the tendency to corrosion. As discussed previously, the emulsifiable cutting oils are mainly coolants and particularly suited to grinding operations. The non-emulsifiable cutting oils are used primarily for lubrication and secondarily for cooling. As long as steels were not particularly difficult to machine and production speeds relatively low, blends of mineral lubricating oils and fatty oils, such as lard oil, sufficed for the jobs.

As high carbon and alloy steels were pioneered and adopted by the automotive industry, sulfurized oils of higher film strength were developed to facilitate machining and forming operations. These oils contain some one to two per cent added sulfur and are manufactured by several methods, including the following: (1) blending of sulfurized fatty oil, which is relatively easily prepared, with the petroleum oil; (2) sulfurizing a blend of fatty oil and mineral oil; (3) sulfurizing the mineral oil; and (4) adding organic compounds of high sulfur content to the mineral oil. In all oil sulfurizing processes, the control of time and temperature is necessary to produce an oil of high film strength, to avoid hydrogen sulfide formation and to insure against eventual separation of crystalline, uncombined sulfur.

Only the "active" or added sulfur content has any value in cutting operations, since the sulfur naturally occurring in mineral oil is too firmly combined to be absorbed on, or react with the cutting tool surface to form a built-up or working edge. A qualitative indication of the effectiveness of the sulfur can be obtained by means of extreme pressure lubricant testers, such as the Almen Falex, SAE and similar machines.

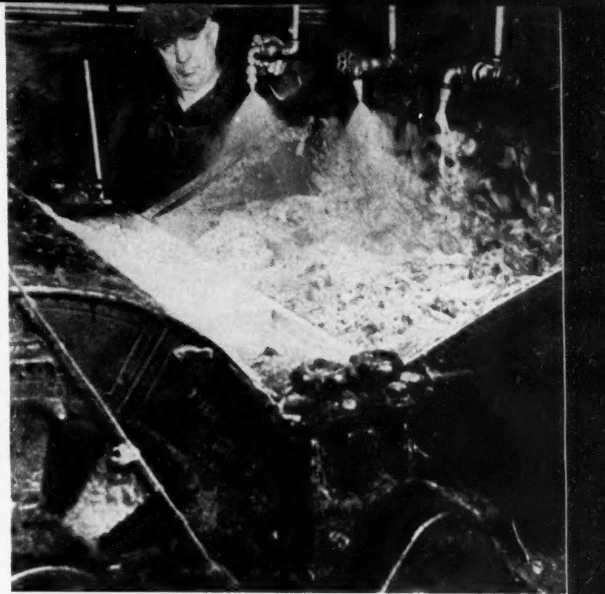
On certain of the tougher alloy steels and at higher production speeds, cutting oils of higher film strength properties than the sulfurized oils are required. As in the case of automotive hypoid gear lubricants, the increased extreme pressure properties can be secured by a combination of sulfur and chlorine additives. Products of this type can be prepared by adding the sulfur and chlorine compounds to the mineral oil or by treatment with sulfur chloride. The comparatively greater film strength of these products in comparison with other cutting oils is indicated by the following Almen test machine results:

Almen Machine Tests-550 RPM, High Carbon Steel Journals and Bushings

Cutting Oils	Number of Weights Carried Gradual Loading	Shock Loading
Mineral-Fatty Cutting Oils	3-6	-
Sulfurized Cutting Oils	13-15	7-9
Sulfur-Chlorine Cutting Oil	15 (1)	13-15

(1) Total machine load

Other outlets for petroleum products in non-emulsifiable process oils include white oils and waxes in food preservation; petrolatums and asphalts in rubber compounds and insulation felts; gas oils in benzol recovery and ore flotation operations; and heavy mineral oils in tin coating processes as a replacement for palm oil.

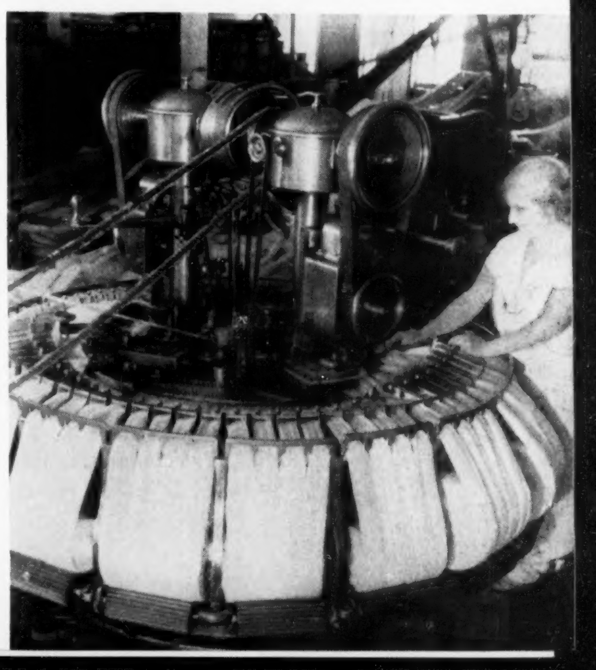


Spraying a mineral wool oil emulsion onto wool as it enters the picker.

As has been pointed out in the discussion of several types of process oils, the petroleum by-products have found a number of applications in the industry. These include the sulfonates and naphthenates, recovered from acid treating and caustic washing operations, respectively, which are employed as emulsifiers and are also used in the manufacture of detergents, fat-splitting agents, paint driers, and toxic agents. Petroleum phenols recovered from cracked petroleum distillates find use as germicides, flotation reagents and anti-oxidants. Mercaptans recovered from the caustic treating solution for light distillates are particularly malodorous and because of this are added to refrigerants or illuminating gas as warning agents in case of leakage.

References:
(1) Farmer, Electrical World, V. 166, 36 (5/39)
(2) Hunter, Ambrose & Powers, Power V. 83, 293 (5/39)
(3) Staeger, Ind. & Eng. Chem. V. 17, 1272
(4) Thomas, Zimmer et al., Ind. & Eng. Chem. V. 32, 229 (3/40)
(5) Ellis, The Chemistry of Petroleum, V. 1, pages 1005, 1062, and V. 2, pages 1064, 1103

Below, key machine in the manufacture of worsted wool.



WHAT INFLUENCES PEOPLE

By C. A. Hazard
Pres., Hazard Advertising Corporation

Like chemist, biologist or physicist, the psychologist of today works with a scientific attitude. The importance of psychology in business and advertising and its relation to the scientific attitude in business is covered in this informative, timely article.

MODERN psychology is not yet an exact science, but in the last few years much progress has been made toward understanding the human mind, recording its reactions and explaining the complicated motions behind the behavior of men and women.

The psychologist today works with a scientific attitude. Like the chemist, the biologist and the physicist he bases his conclusions on facts arrived at through research and testing. Many of these conclusions merely corroborate the opinions held by intelligent people for centuries. Others upset all previous conceptions of why people think, feel and act as they do.

Among the greatest revelations is the discovery of the tremendous part the subconscious mind plays in influencing the opinions and actions of *all* people whatever their level of intelligence. Many books have been written by the experts about this great unknown portion of the brain. The mind has been compared to an iceberg, the visible part of which constitutes only a small fraction of its true size. So with the brain. The conscious part, the part with which we act and think rationally, is merely the upper strata, and only when we are thinking originally or constructively does this conscious part come into play. The rest of the time, in the thousand and one duties and contacts of everyday life which provide stimuli for reaction, we are governed by unknown, unrealized impulses, desires and instincts. These are the heritage handed down through the ages from the time when man was an animal. The conscious man, then, is what civilization has made him, and the subconscious man is what he is without the laws, taboos, morals and customs civilization has imposed upon his nature.

The purpose we have in bringing out these facts is to show how much more than they will admit, intelligent people are influenced unconsciously while they sincerely believe they are acting on rational principles. In other words, *most* of our decisions are arrived at emotionally and *most* of our thinking is done to justify actions already decided upon through emotion. To doubt this is to doubt the findings of accredited scientists. We believe that intelligent people will readily admit its truth.

Psychologists are busy estimating the power of suggestion in motivating actions or influencing decisions. We do not need to be told that it is important, but few of us realize its true importance. The fact is that we are moved to act every hour of the day by suggestions the existence of which we seldom realize.

Chain of Impulses

We follow a chain of impulses, link by link, throughout our wakeful hours. It leads us where our subconscious desires want us to go and only in the strongest, most highly trained minds is the course of this chain directed by logic and reason. This is not to disparage the intelligence of human beings or to minimize their powers of discrimination. It is a fact that alert minds are notoriously susceptible to suggestions from an outward source—because they grasp ideas more swiftly . . . respond more quickly to stimuli . . . and consequently need greater discipline to avoid being carried away by their own momentum. A dull mind lags . . . acts slower, but ultimately is moved to action by a stimulus. It is only the disciplined mind predetermined by conscious fixation of attitude that is untouched by the power of suggestion. Wishful thinking is as prevalent among the greatest scientists as it is among ordinary people, but scientists are *aware* of their susceptibility. Consequently, in their work they impose restrictions on their impulses—by assuming the scientific attitude, which demands proof before decision and reduces theory to a minimum.

As a principle of self-improvement the Bible says to "Assume a virtue if you have it not" and psychology bolsters this with advice in certain cases, to combat a bad habit by cultivating a better one. Many people achieve character by lifting themselves mentally by the bootstraps. It is a principle of self-improvement that is based on sound psychology. Saying a thing is so, of course, does not make it so. But in the matter of character, assuming a virtue more often than not results in the ultimate possession of that virtue. Every great religion in the world has this element in its teachings. It is the reiterated theme of all character-building systems and schools. Sales psychology, a branch of the parent science which is revolutionizing the selling methods of modern business, has adopted it as one of its most valued principles.

So far we have referred to the power of suggestion only as it applies to the individual in his relations with himself. Let us now see how it can be used to influence others, how it is becoming recognized as a force as great, if not greater, than hard, factual arguments.

An incident enacted recently in the classroom of a mid-western university will serve to illustrate the power of suggestion. An instructor, holding up a small perfume bottle, announced that he would shortly remove the cork and asked the members of the class to raise their hands as soon as they detected the odor. Within a few minutes hands began to shoot up among the first few rows. When practically every member of the class had raised his hand the instructor revealed the fact that the bottle contained nothing but plain water.

Incidents like this are not hard to find in everyday life. They happen continually. It is impossible to over-estimate the influence that quite natural but illogical *assumptions* have over our thinking. Men whose business it is to direct or control people realize this and in many cases find it infinitely more persuasive than argument . . . for argument often has the unhappy result of antagonizing rather than convincing.

Mob Psychology

If people are so suggestible as individuals, how much more so they are in crowds! In a mob the most intelligent person often loses all sense of self-direction. Contrary to general opinion, the mob spirit is as prevalent in educated groups as it is among backward groups. It takes different and milder forms, to be sure, but it is nevertheless as powerful. No one is proof against its influence. In most cases mob spirit is destructive; its violence directed by lawless leaders. But there are notable occasions where mob spirit has been instantly quelled by an inspired suggestion. One of the most famous examples of this occurred during the Siege of Paris, in the Franco-Prussian War. A mob storming the Louvre demanded the immediate execution of an army officer who had been accused of selling certain fortification plans to the

enemy. The fact that these same plans had been published and were available to anyone who asked for them made the charge ridiculous. To quell the violence of the crowd an orator who knew this fact assumed leadership.

"Fellow citizens," he harangued, "you have done a great, patriotic deed in apprehending this man. Your work is now over. Let the government conclude the investigation. Justice—pitiless justice—will be done! In the meantime we will keep the prisoner in custody." The mob cheered and dispersed and the officer's life was saved.

Power of Suggestion

Another strange incident occurred at a recent lynching in California. A mob had dragged two kidnappers from their cells and were bent on hanging them. At the height of the excitement someone suggested that the crowd kneel in silent prayer for the victims. This was done in solemn dignity, after which the lynching was perpetrated. At this psychological moment, when the action of the crowd was held in balance—the crime *might* have been averted by timely oratory similar to that of the French deputy! Simply that the crowd could be made to do such an absurd thing as to kneel in silent prayer showed that they were amenable to *any* suggestion. Yet there was no one to step into the breach.

Panics feed on the suggestibility of the human mind. One of the strangest that ever occurred was the "Great Fear" of 1879. This mental contagion broke out in Paris one night. For an entirely unknown reason people became afraid—of what, no one knows. Alarm bells were rung all over the city. Citizens hid themselves in cellars. Troops were dispatched out of the city in an attempt to discover the presence of an enemy. None was ever found—although it was discovered that earlier in the evening someone on the outskirts of town had taken a pot shot at a rabbit. This strange fear contagion spread to many portions of Europe—seemingly without any foundation whatever.

There are amazing examples of personal suggestibility displayed by strong men over multitudes. Such confidence did the people of the middle ages have in the personality and divine purpose of Peter the Hermit that millions followed him to an utterly useless mission to Jerusalem. It is estimated that approximately 7,000,000 lives were lost in the crusades—an undertaking inspired by the magnetism of a fanatical genius in sack-cloth with a flair for making people think *his* way without recourse to argument. Our modern spellbinders are pikers compared to Peter the Hermit. What could he do today in America—with newspapers, magazines, and a broadcasting station!

It is a peculiar thing that men of superior intellect, greater moral courage and finer sensibilities are loath to use this power of suggestion to influence and lead people. Practically always it is the charlatan, the spellbinder, the demagogue who piles up the big following, while the man of scruples whistles his futile song of facts and proofs and arguments. Yet the same methods by which the former fires the imagination and moves people to act can be used with equal effectiveness by the latter. It is true now, as it has always been true, that *how* you say a thing counts as much, if not more, than *what* you say.

This is all very interesting, you suggest, but what has it got to do with advertising and what does it mean to me?

It means just this—that advertising, to be effective, must utilize the elementary principles of psychology and especially must it contain that most valuable of all elements—suggestibility.

Hard headed business men are prone to over-emphasize the value of facts, argument and reasoning in influencing people.

Brand Consciousness

Ask a man why he purchases a particular brand of clothes or why he patronizes a certain store for his jewelry or his furniture. He will say that he believes this source to give him the greatest value for his money. He is sincere, of course. Pressed for a reason why he believes this source to be preferable above all others, he would perhaps not be so definite. But even if he were definite and stated many reasons, you could undoubtedly show him why, for exactly the same reasons, another source would be equally as reliable.

The emotions that impel people to buy things offers an interesting field for study. But of more interest to the manufacturer are the reasons why people favor certain brands in preference to others when to all appearances there is no intrinsic feature about them that would attract more attention or create a feeling of greater desirability.

In the industrial field there are hundreds of products which must meet certain specifications before they are even offered for sale. No one would want a "better" product because a "better" product would be useless. Sulfuric acid, for instance, is one of industry's greatest staples. It would be impossible for a producer to claim exceptional features for his particular brand. Yet some companies are continually increasing their sales of sulfuric acid at the expense of other companies who are equal in every respect as to service facilities, experience, etc. Somehow, somewhere, an impression has been made that purchasing sulfuric acid from these companies is an especially desirable thing to do. A movement as unreasonable as the Great Fear of 1879 is in progress, and like the people under the spell of Peter the Hermit, these modern Crusaders are only partly aware of the real motives that have compelled them to alter their courses. To claim that advertising is entirely responsible for creating a movement of the sort is, of course, absurd. But advertising—good advertising that suggests in art, layout, copy and physical detail an atmosphere of quality and a background of exclusiveness—can and is laying the foundation for many a movement of this type.

Advertising of this sort cannot be done by a manufacturer who says, "I advertise to keep my name before the public." Such a man cannot lift his own character nor can be influence others to patronize his product. At best he can merely save a part of what is slipping from his grasp.

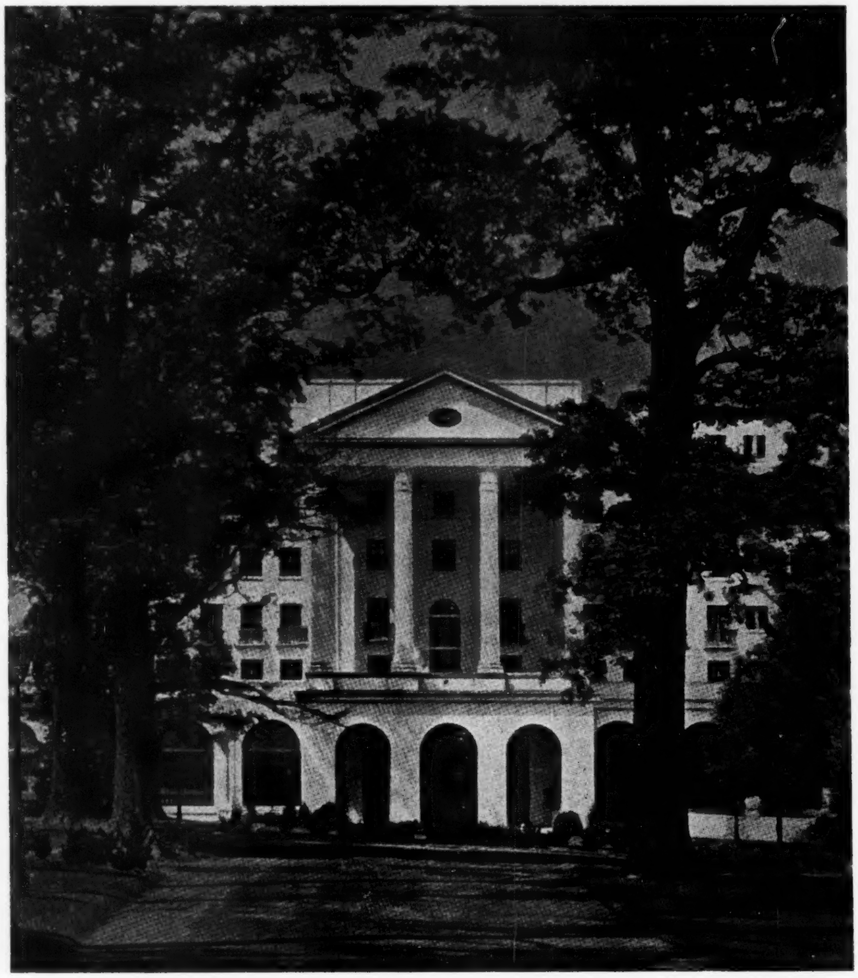
We believe that advertising should have all the elements of character that make people accept a man as a leader—courage, conviction, confidence, integrity. It should not only impress people with the desirability of the product but it should also stamp indelibly on their minds the personality of the company which makes this product.

If a man is weak, indecisive and apologetic his words are taken at the value he seems to place on them. If he is loud, vulgar or a notorious liar he is likely to antagonize everyone he meets. But if he has dignity, quiet confidence and is forceful, interesting and reliable in what he has to say, his statements are *conditioned* for acceptance by his personality.

True of Business

If this is true of a man it is also true of a business, for a business is only a greater man and its advertising must convey force of character if it is to impress people and influence their opinions. It is imperative of course that a company's advertising contain sincere, accurate and convincing reasons why its product is preferable—but this is no more important than the atmosphere of quality, the impression of superiority that the reader gets subconsciously through contact with the advertisement as a whole. As we have emphasized, it is the suggestion of quality and character that has an almost unbelievable power over individuals. Thus, a finely prepared advertisement does a great deal more than keep a name before the public; it is definitely constructive . . . puts the reader in a receptive frame of mind without his actually realizing it and lays the foundation for future acceptance. The power of this method is being appreciated by more and more advertisers. Many are not only increasing their sales steadily but are establishing a lasting prestige for their firms which is

(*Continued on page 114*)



The Greenbrier Hotel *White Sulphur Springs, W. Va.*

FERTILIZER CONVENTION

Discusses Raw Materials Problem

By Walter J. Murphy
Editor, Chemical Industries

The fertilizer industry met last month with a twofold problem on its mind. First was the increasing demand of agriculture for fertilizer during the present emergency. Second was the drain on basic chemicals which serve both the fertilizer and the munitions industries. Here is a complete report of what was studied and accomplished.

FACING the pressure of supplying not only increasing demands of agriculture for fertilizer during the present emergency but also of meeting vital munitions requirements of the Army and Navy for basic chemicals used in fertilizer, over 400 leaders of the fertilizer industry met in White Sulphur Springs at the Greenbrier for the Seventeenth Annual Convention of the National Fertilizer Association on June 9-11.

Demands for chemicals essential to the production of explosives, transportation of raw materials, and many other problems incident to the emergency and of vital concern to the American farmer were discussed by such outstanding experts as C. C. Concannon, Bureau of Foreign and Domestic Commerce, Horace M. Albright, Vice-President, U. S. Potash Co., M. H. McCord, The Davison Chemical Corp., Merle Thorpe, Editor, *Nation's Business*, and Dr. E. R. Weidlein, Director of Mellon Institute, and Chief of the Chemicals Division of the OPM.

John E. Sanford, President, Arthur Fertilizer Works, and President of the Association, presided and delivered the opening address, discussing problems of the coming year in the light of the fact that last year fertilizer consumption reached an all-time high and sales so far this year indicate another increase.

"An all-time high for fertilizer consumption was established by farmers when 8,311,000 tons of commercial fertilizer were used on farms during the past crop year," he reported. "This is an increase of more than one-half million tons over the preceding year. Tonnage figures themselves do not tell a complete story of plantfood consumption in this banner year, since there has been a significant increase in the amount of plantfood con-

tained in a ton of fertilizer. This year's tonnage figure was 16 per cent above 1920, but the amount of plantfood contained and used was 64 per cent greater.

It seems likely in view of the figures quoted by the speaker that another tonnage increase is in store for next year, since tag sale figures for the first four months of 1941 are nine per cent over the same period in 1940.

Despite the fact that during the World War the country was entirely dependent upon foreign sources of supply for nitrogen, we now have the capacity to produce all the nitrogen needed for munitions and fertilizer, C. C. Concannon told the National Fertilizer members. Mr. Concannon, however, outlined a number of "ifs" that entered the picture and made it quite difficult to make any specific estimates of what our nitrogen requirements for munitions and fertilizer would be. Among the "ifs" are: "What kind of a shooting war may we find ourselves in?" "How many men will be involved?" "How far will Great Britain require munitions from us?" "What aid in the way of food for abroad will be necessary?"

Mr. Concannon, however, struck an optimistic note when he stated: "The nitrogen requirements of the Army and Navy and of the government of any country whose needs the President deems vital to the defense of the United States, can be supplied by American plants."

"Although ammonia supplies are tight at the present moment, the future outlook is favored by increased supplies from the three nitrogen plants in course of construction, and the possibility of obtaining some additional nitrogen from Canadian plants. The nitrogen supply will be watched closely by the Government and every effort will be made to furnish the normal needs of agriculture without recourse to priority regulations," he said.

Phosphate and Transportation Problem

"Although there are ample supplies of raw phosphate rock for fertilizer use, the superphosphate manufacturer during the next year faces many factors beyond his control," said M. H. McCord, The Davison Chemical Corp., Baltimore, Md., in an address, "Problems Confronting the Phosphate Producers." "Transportation is the unknown factor. The Maritime Commission proposes to take over coastwise vessels now handling rock and sulfur to principal seaboard superphosphate-producing centers. This will mean transportation of more than one million tons of rock phosphate and one-half million tons of sulfur one thousand miles or more from the mines by rail. Railroads claim they can handle these northward movements together with increased demands on other commodities. Their claim is very questionable. Eighty per cent of the cost of superphosphate at the factory is for raw materials so that increase in the cost of rock and sulfur is reflected at once in the product."

Mr. McCord devoted time to a very significant analysis of the situation generally and in phosphates at the outbreak of World War 1 and showed how in many ways the present emergency parallels conditions now. The speaker reminded his audience that despite the adverse conditions of two decades ago somehow the difficulties were met satisfactorily.

Potash Independence Achieved

H. M. Albright, Vice-President, United States Potash Co., Inc., New York, N. Y., discussed the other important fertilizer chemical, potash, contrasted conditions of potash supplies in the first World War with those of the present time. "Because we were dependent on foreign sources for our potash then, and European supplies were cut off in the World War, little potash could be produced in the United States by various processes, all of them expensive," he said. "Only small supplies were ever available. Prices soared from \$35.00 to \$350.00, and even \$500.00 a ton for 50 per cent muriate."

"Now there is almost sufficient high-grade muriate to supply the requirements of the American market for both chemicals and fertilizers. Any deficiency that may occur can easily be supplied with New Mexico run-of-mine salts of satisfactory grade," he said. "Potash prices are approximately the same as when the present war began and are about \$10.00 a ton lower than they were in 1914. New price lists just issued by three of the four large American producers of potash promise continuance of all favorable conditions as to quantity, quality, and price."

Demand for Chemical Engineers

Dr. E. R. Weidlein, Chief of the Chemical Division of the OPM, stated in his address that the chemical industry has a job of gigantic and almost alarming dimensions cut out for it. "This immense task is complicated by the fact that modern war demands the most formidable and at the same time the most delicate combination of machinery ever produced in volume," Dr. Weidlein pointed out. "The country has been industrially unprepared for protection from attack. For our future welfare, therefore, martial machinery must be built from the ground up.

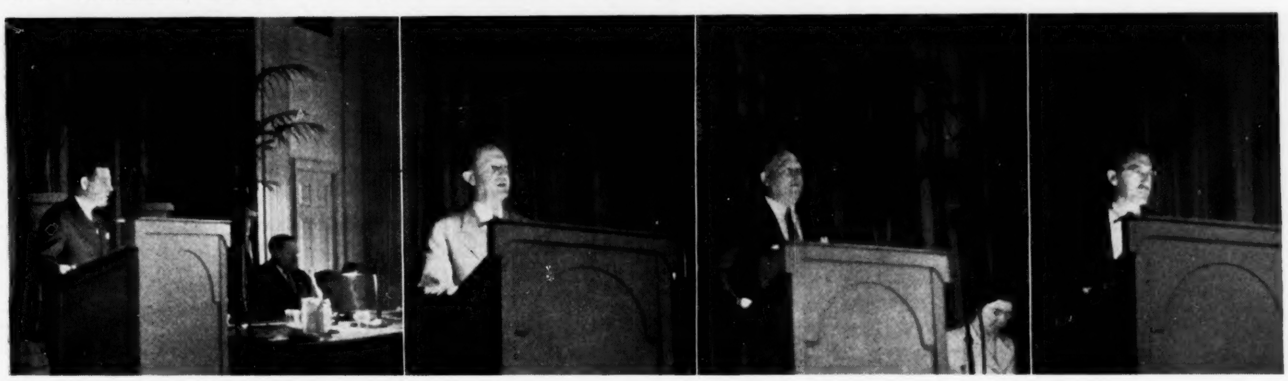
"There is a great need for technically trained men," he said. "In my opinion, every professional chemist, chemical engineer, and technician will be needed to carry out effectively the essential projects required. Every effort must be made to supply the needs of defense industries for chemical engineers."

Future of Southern Agriculture

"Southern States contain many opportunities for agricultural pursuits," said Dr. R. F. Poole, President of Clemson College. "Agricultural stagnation in Southern States is greatly influenced by inadequate research and insufficient scientific personnel to promote latent but visible opportunities."

Other ways to stability in the South which he outlined are: diversification; scientifically developed pastures; breeding of plants with resistance to disease; insects; cold and drought; and a better understanding of crop, soil and fertilizer relations. The South too, be said, should look toward better animal and plant bal-

Below, some of the speakers. (Left to right) Dr. E. R. Weidlein, Director, Mellon Institute and Chief, Chemicals Division, OPM; Horace M. Albright, vice-president, U. S. Potash; Dr. R. F. Poole, president, Clemson College; C. C. Concannon, Bureau of Foreign and Domestic Commerce.



ancing, merchant and farmer cooperation, and a strong philosophy of education with less emphasis on synthetic sociology and more on economics and vocations.

No Time for Agricultural War Boom

A plea that agriculture guard against a repetition of the destructive expansion of our agricultural plant which occurred during the World War was made by Charles J. Brand, Executive Secretary and Treasurer of The N. F. A.

"The World War revolutionized the economic and financial structure of the world," said Mr. Brand who was coadministrator of AAA. "Destructive and widespread as is the present Afro-European war, it is still far from being a world war although it seems to be headed directly that way, and it promises to change the world's political and social face as the Great War changed its economic and financial structure.

"The World War gave agriculture an unhealthy boom from which it has never recovered. The urge for national self-sufficiency that largely originated in the World War is being greatly intensified in this war. Unfortunate as it may be, the trend of our export trade in the future will be downward, particularly as to usual agricultural products as distinguished from specialties. The 30,000,000 acres or thereabouts which in the past have been devoted to growing crops for export must, as quickly as possible, be turned to production of crops for domestic uses. Greatest caution must be exercised lest we again indulge in an unwise and destructive expansion of our agricultural plant such as that experienced during the World War."

Guest speaker at the Association's Dinner was Merle Thorpe, Editor of *Nation's Business*. According to him many factors and moves in the war effort are building the framework of a socialist society in the United States.

"Behind the scenes in Washington today a titanic struggle is under way," said Mr. Thorpe. "The battle lines are drawn. On one side are those who would change our form of society. On the other side are business men who wish to organize the country's industrial machine for the greatest war aid, but who, after the war effort is over, wish to see a return to individual ownership and operation of industry. They fear, and rightly, that many moves in the war effort will result in a more or less permanent collectivist or socialistic framework of American society.

"They fear deeply the possible destruction of the American way of life. They feel that it is a real threat, because some of our leaders, by their own admission, had lost faith in America before the present emergency arose, and are today in the Nation's distress, working for a new order of their own—an America of nationalized industry and agriculture, a regimented way of life."

Looking ahead to readjustments after the war, Mr. Thorpe said that business must be on guard now and in the future, if it would defeat the forces, working for an economy planned along collectivist lines. "Businessmen have long sensed what philosophers have discovered that economic freedom is blood brother to the five other freedoms of the individual—religion, press, assembly, petition, and speech," he said. "If business holds fast to these ideals and keeps the faith, much of the distress which will naturally follow the war-time boom will be eliminated in the hard days of reconstruction."

The question of transportation assumed most serious proportions in the minds of several of the speakers at the convention. The withdrawal of coastwise vessels leaves the railroads of the country with a perfectly gigantic job to perform. A large proportion of our supplies of phosphate rock, sulfur, potash and other fertilizer materials in normal times moves to East Coast points by boat. In the light of the formal and informal discussions at the meeting the problem of transportation is one that may assume far more serious aspects than the problem of producing adequate quantities of these materials.

The new officers are: President, John A. Miller, Price Chemical Co., Louisville, Ky.; Vice-President, A. L. Ivey, Virginia-Carolina Chemical Corp., Richmond, Va. Charles J. Brand was reelected Executive Secretary and Treasurer.

The following Directors-at-Large were nominated and elected for a term ending in 1944: C. F. Burroughs, District 4, F. S. Poyster Guano Co., Norfolk, Va.; Leon H. Davis, District 9, The Southern Cotton Oil Co., New Orleans, La.: W. C. Geoghegan, District 3, The Davison Chemical Corp., Baltimore, Md.; and John E. Sanford, District 6, Armour Fertilizer Works, Atlanta, Ga.

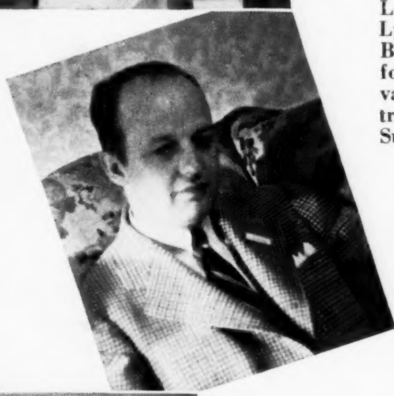
Above, John A. Miller, Price Chemical Co., newly-elected president of the National Fertilizer Association.

Directors nominated by the Districts and elected were: B. H. Brewster, III, District 3, The Baugh & Sons Co., Baltimore, Md.; S. F. Elwood, District 10, The Farmers Fertilizer Co., Columbus, Ohio; R. L. King, District 6, Georgia Fertilizer Co., Valdosta, Ga.; H. A. Parker, District 8, Sylacauga Fertilizer Co., Sylacauga, Ala.; C. D. Shallenberger, District 9, Shreveport Fertilizer Works, Shreveport, La.; M. C. Taylor, District 11, Magnolia Fertilizer Co., Seattle, Wash.; F. J. Woods, District 7, The Gulf Fertilizer Co., Tampa, Fla. F. N. Bridgers, District 4, Farmers Cotton Oil Co., Wilson, N. C., was reelected for the remainder of the term expiring in 1943.

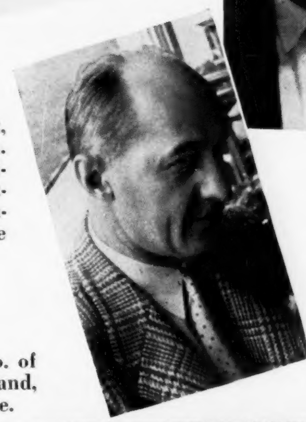
A. H. Case, U. S. Phosphoric Products Div., Tennessee Corp., was elected to fill a vacancy in District 7 expiring in June, 1942.

Below, John E. Sanford, Armour Fertilizer Works, and outgoing president of the Association, with Merle Thorpe, editor, "Nation's Business."

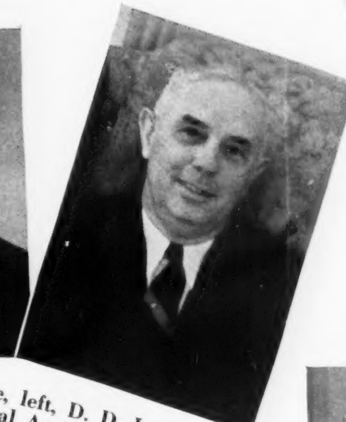
Fertilizer Leaders at White Sulphur



Left, W. L. Waring, Jr., president, Lyons Fertilizer Co., Tampa, Fla. Below him, J. Rivers Adams, California Chemical Co., Division Westvaco Chlorine Products. Above, entrance to the Greenbrier at White Sulphur.

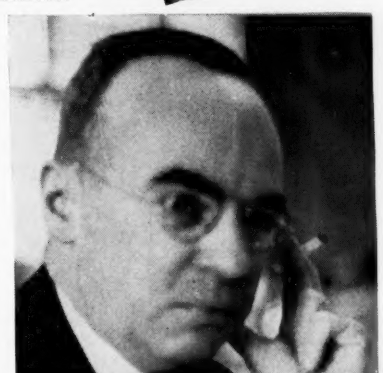


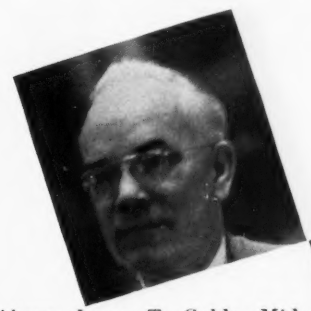
Right, George E. Petitt, Potash Co. of America. Below him, J. Rich Holland, president, Wiley & Co., Baltimore.



Above, left, D. D. Long, International Agricultural Corp., Atlanta, Ga. Directly above, Harry C. Moore, Armour Fertilizer Works, Atlanta, Ga.

R. F. Poole, president, Clem
D. S. Murph, N. F. A. Dire
C. M. Harris, wife, C. M. H
of America.





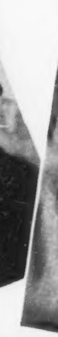
Above, Leroy T. Goble, Midwest Soil Improvement Committee, Chicago. Below, H. H. Meyers, Virginia-Carolina Chemical Corp., Richmond, Va., and Albert B. Baker, Bradley & Baker, New York.

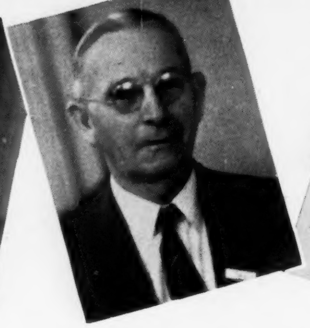
Left, L. M. Aycock, California Chemical Co., Division Westvaco Chlorine Products.

Left, W. A. Higginbotham, Armour Fertilizer Works, Albany, Ga.

Below, Charles J. Brand, executive secretary and treasurer, N. F. A. Next to him, H. R. Wemple, Texas Gulf Sulphur Co.

Left corner, A. F. Kingsbury, The Rogers & Hubbard Co., Portland, Conn. Below, E. J. Morse, Purchasing Agent, Tennessee Corp.



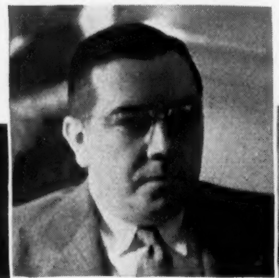





Top row, left to right, Charles J. Burroughs, Jr., F. S. Royster Guano Co., Norfolk, Va.; Miss Margaret Ranlitt, A. W. Higgins & Co., Prisque Isle, Me.; F. P. Morison, Morison Bros., Bangor, Me.; J. S. Whittington, F. W. Berk & Co.; A. W. Higgins, A. W. Higgins Co., and H. R. Smalley, N. F. A.

Above, right, Thomas F. Bridges and F. M. Bridges, Farmer's Cotton Oil Co., Wilson, N. C.

R. F. Poole, president, Clemson College and D. S. Murph, N. F. A. Directly below, Mrs. C. M. Harris, wife, C. M. Harris, Potash Co. of America.



Above, Franklin Farley, International Agricultural Corp. Right, W. Kerr Scott, Commissioner of Agriculture, State of N. C.


Right, Oscar Smith, Smith-Douglas Co., Norfolk, Va.

Right, Ben James, N. F. A.; J. W. Wizeman, O. P. M.; and F. S. Lodge, N. F. A. Above them, Walter M. Niell and Logan G. Hill, St. Regis Paper Co.





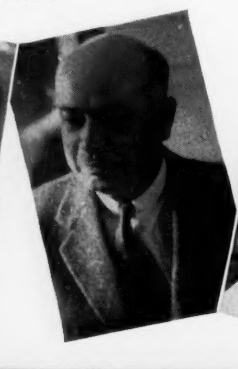


Above, left to right, J. O'Hara Sanders, Fulton Bag & Cotton Mills, Atlanta. Merle Thorpe, editor, Nation's Business, and E. S. Dickerson, Jr., Dickerson Co., Philadelphia.

Left, G. M. Stark, California Chemical Co. Below, left to right, W. E. Schaffnit, Stedman's Foundry & Machine Wks.; Wm. Caspari, Jr., Davison Chemical Co., Baltimore and S. S. Lawrence, Shell Chemical Co., San Francisco.

Below, left to right, Mrs. George E. Petitt, Mrs. J. A. Howell, and Mrs. Travis Whitsel. Corner, Mrs. R. G. Crammond, Mrs. Raymond R. Hull and W. E. Mathews, Chilean Nitrate Corp. Above them, C. N. McNulty, Texas Gulf Sulphur.



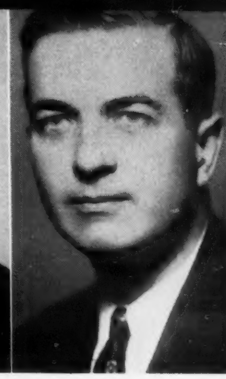


Headliners in the News

Arthur G. Chase, vice-president and treasurer of Continental Can, recently was elected a director of that company.

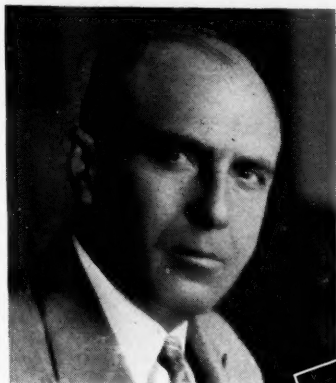
Dr. G. Acerolf who has left Yale University to join the Monsanto research staff at Dayton, Ohio, it was announced.

C. W. Christensen has been promoted to general manager of sales, rubber service department, Monsanto Chemical Co.



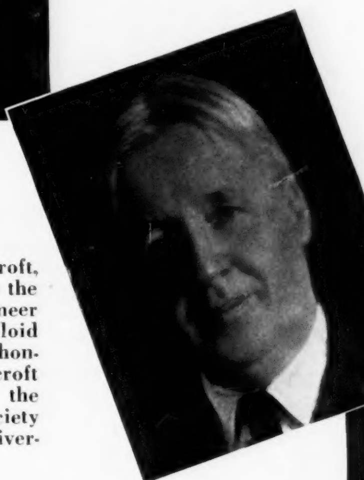
R. C. Wickersham has been appointed general manager, White Tar Co., of N. J., Inc., a Koppers Co. subsidiary.

Left, W. E. Griffiths, manager of the new development engineering department recently set up by Allegheny Ludlum Steel.



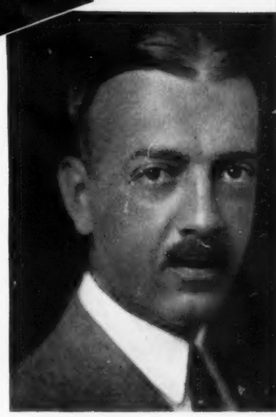
Left, Harry Leigh Derby, president and director of American Cyanamid, last month was elected a life trustee of Rutgers University, New Brunswick, N. J.

Left, W. F. Detwiler, Jr., assistant manager of Allegheny Ludlum Steel's new development engineering department.



Right, Dr. Wilder D. Bancroft, on the Cornell Faculty for the past 46 years and a pioneer in the investigation of colloid chemical phenomena, was honored by a Wilder D. Bancroft Colloid Symposium of the American Chemical Society June 19-21 at Cornell University.

Left, Carl B. Pollock, recently appointed manager of Allegheny Ludlum Steel's plant at Breckenridge, Pa.

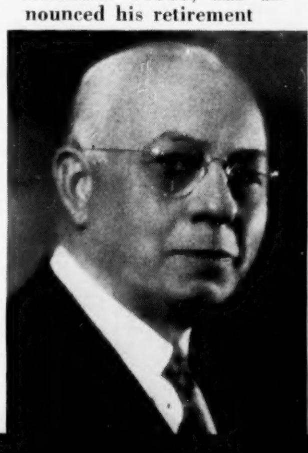


Right, J. S. Cooke, assistant treasurer of William S. Gray & Co., has severed his connection with that company to accept an appointment as Major in the Specialist Reserve of the U. S. Army.

Left, George W. Evenas, recently promoted to general superintendent of Allegheny Ludlum Steel's Breckenridge plant.

Left, Melvin C. Harris, newly appointed district manager of two Allegheny Ludlum Steel plants in the Pittsburgh district.

A. F. Dohn, formerly vice-president in charge of tool steel sales for Allegheny Ludlum Steel, has announced his retirement



Stanley A. McCaskey has been elected assistant secretary of Allegheny Ludlum Steel by recent action of the board of directors.

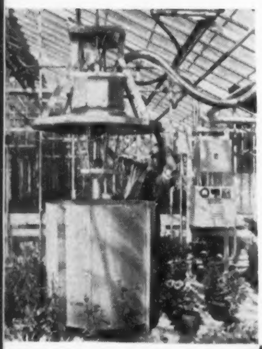
Howard M. Givens, Jr., has been made manager of tool steel sales of Allegheny Ludlum.

DuPont Builds New Laboratory For Plant Control Research

Du Pont recently completed a three-story laboratory at its experimental station in Wilmington for pest control research, with the latest equipment installed for the study of insecticides and fungicides. A carbon arc lamp, said to be the closest approach yet to natural sunlight has been installed along with other modern equipment. Dr. Wendell H. Tisdale is director.

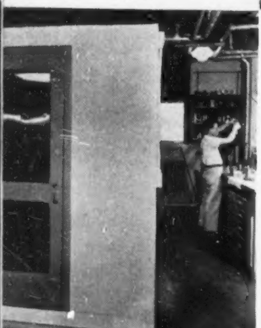
Above, the new pest control laboratory. Right, Dr. Wendell H. Tisdale. director of the new lab.

Right, above, flies carefully reared in captivity to be used in later studies of insecticide chemicals. Below, effect of insecticides on various flowers is studied.

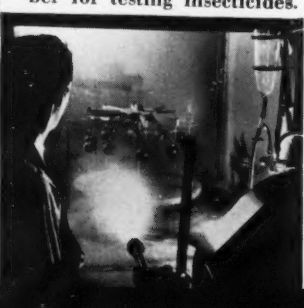


Left, the carbon-arc lamp, science's nearest approach to natural sunlight.

Right, the lethal chamber in which insecticides are tested on flies.



Left, the fly laboratory, in the center, the lethal chamber for testing insecticides.



Right, a test to discover the effectiveness of chemicals in controlling the codling moth on apples.

Right, spraying plants with apparatus which duplicates pressure sprayers employed in fields and orchards. Below that, testing the effectiveness of fungicidal chemicals.

27th Semi-annual Meeting of NAIDM at Edgewater Beach Hotel, Chicago

Over 200 members and guests gathered at Chicago June 9 and 10 for the 27th semi-annual meeting of the National Association of Insecticide and Disinfectant Manufacturers. On this page are pictured some of the personalities at the gathering. For full story and other photos see page 58.

Above, left to right, J. N. Davies, Henry Barroll & Co.; O. M. Poole, Derris, Inc.; and Dr. H. C. Fuller, NAIDM's Washington consultant.

Below, left to right, H. W. Baldwin, Baldwin Labs, Saegertown, Pa.; Dr. Ed. M. Searls, University of Wisconsin; and F. O. Huckins, Sinclair Refining Co.

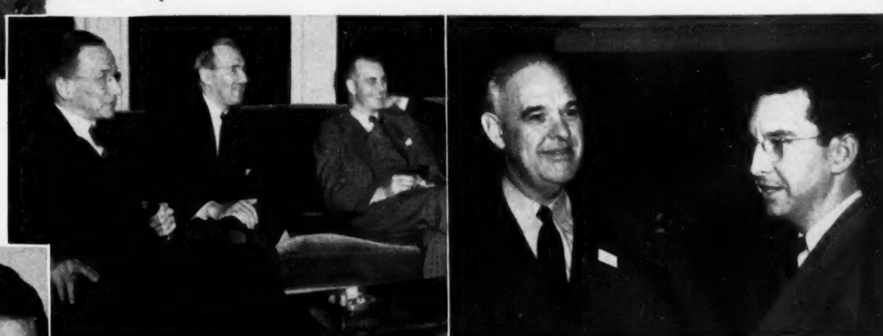
Right, S. J. Hill of du Pont, and F. C. Renner, Monsanto Chemical Co.

Above, Dr. Bowden, American Home Products, Jersey City, and G. A. McLaughlin, McLaughlin-Gormley-King.

Above, Marvin Ralstead, U. S. Industrial Chemicals, and Henry A. Nelson, Chemical Supply Co., Cleveland.

Below, left to right. George L. Simmonds, U. S. Sanitary Specialties Corp.; Ralph Jackson, West Disinfectant Co.; E. B. Eddy, Rochester Germicide Co.

Below, left to right, C. E. Smith, Socony-Vacuum Oil; W. E. G. Campbell, John Powell & Co.; Dr. Alfred Weed, John Powell & Co.; William Wagner, Tanglefoot Co.; C. S. Barnhart, Ohio State University.



Below, William Janney, National Can Co., and Russell H. Young, Davies-Young Soap Co., Dayton, O.

Below, left to right, Robert Lockhart, Candy Co., Chicago; Marshall Magee, T. F. Washburn Co., Chicago; Dr. W. A. Simanton, Gulf Research & Development, Pittsburgh; John Powell, John Powell & Co.; Dr. E. R. McGovran, U. S. Department of Agriculture (Insecticide Testing Laboratory); and J. J. Brenn, Huntington Labs, Huntington, Ind., past president of the NAIDM.

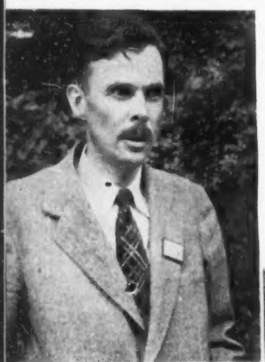
Dorr Company's Westport Lab Scene of A. I. Ch. E. and S. C. I. June Outing

June meeting of the New York Section, A. I. Ch. E. and the American Section, S. C. I., was a ladies day and outing held at the Westport, Conn., laboratory of the Dorr Co., Inc., the N. Y. Junior Engineers group also participated. Dr. John Van Nostrand Dorr acted as host for the day, provided a program of both information and recreation.

Above, a scene taken from the rear on a bridge crossing the dam of the Dorr Co., Westport Laboratory building.

Left, Dr. John Van Nostrand Dorr, president of the company, with his pet, "Blue Monday."

Right, H. E. Outcault, St. Joseph Lead Co.



Left, F. L. Bosqui, Dorr Co., metallurgical specialist.

Left, Dr. T. H. Lashar, Stevens Institute, and Dr. W. W. Duecker, Texas Gulf Sulphur.

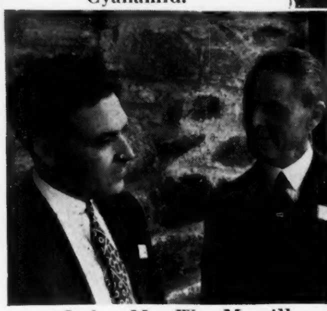
Right, J. D. Grothe, Dorr Co.

Left, Anthony Anable, Dorr Co., and his fiancee, Miss Gloria Hollister. (Wedding's this fall.)

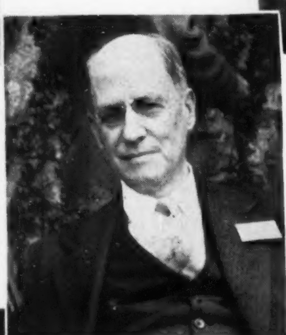
Right, H. A. Linch, chief engineer, Dorr Co., and Dr. N. A. Shepard, American Cyanamid.

Left, Dr. C. R. Downs and daughter, Caroline.

Right, Dr. Gutzeit, Dorr Co., and A. L. Stern.



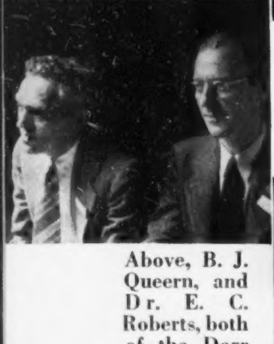
Left, Dr. R. Akin, du Pont plastics division, and C. M. Joyce, also of duPont (Arlington works.)



Right, G. D. Van Arsdale, Dorr Co.

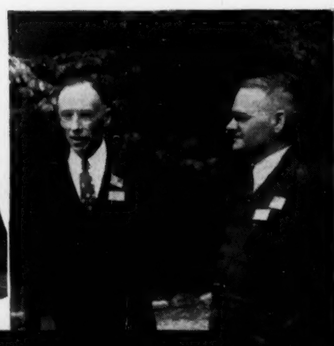
Left, M. W. Merrill, U. S. Metals Refining; Dr. Otto B. May, Otto B. May, Inc., and Paul Weingart, U. S. Metals Refining.

Right, Dr. Walter J. Baeza, Industrial Research Co., and Miss H. Basch.



Above, B. J. Queern, and Dr. E. C. Roberts, both of the Dorr Co.

Below, left to right, G. T. Skaperdas, M. W. Kellogg Co.; W. H. Healey, General Chemical and R. S. DeWolfe, M. W. Kellogg Co. Next photo, J. J. Freeman, chief chemist, U. S. Steel, and Dr. C. L. Knowles, Dorr Co.



Left, A. D. Camp, Dorr Co., and W. L. Spalding, American Cyanamid.

CHEMICAL SPECIALTIES

Coldfoam Soapless Soap Powder

One ounce of Coldfoam added to a pail (10 quarts) of water is all that is needed, according to the company, for a maximum of suds which will quickly remove dirt, grease, grime from painted surfaces, walls, floors, wood, tile, marble, etc. A product of the Savogran Co., Boston, Coldfoam is an "all-round" cleaner.

INDUSTRIAL · HOUSEHOLD · AGRICULTURAL

N.A.I.D.M. MAPS PLANS for Defense Production

By Paul B. Slawter, Jr.
Assistant Editor

National Association of Disinfectant and Insecticide Manufacturers met in Chicago last month to discuss problems of national defense and hear reports of research activities for the period. Here is a report of what happened and a quick glance at the proposed new model insecticide bill for use in states legislation.

THE Edgewater Beach Hotel, Chicago, was host last month to the 27th Semi-annual Meeting of the National Association of Insecticide and Disinfectant Manufacturers, Inc. Over 200 members and guests attended the two-day session June 9 and 10, heard discussions of problems resulting from the national defense program, reports of research activities and got first glimpse of a proposed model insecticide bill.

Unanimously adopted was a resolution asking the elimination of undue interference by the government in the manufacture and distribution of disinfectants, antiseptics, germicides, household insecticides, sanitary supplies and other similar articles. The model bill which is to be submitted to each state when drawing up legislation affecting the industry was tendered to a committee for further consideration and study.

W. J. Zick, Stanco, Inc., president of the association, told the assembled group in his address, "Trading Down," that association members are going through a period of price conscious merchandising not based on manufacturing costs or economies resulting from volume or research. "It is apparently a desire to get volume, forgetting entirely whether the volume is profitable or not," he said.

"As a result, a large number of inferior products are on the market which are appealing to the price buyer and the supposedly price conscious consumer. Instead of trading up that grade AA insecticide because quality will do the job, or because a quality floor wax will last longer and give better and more permanent finish, all one hears is price. A larger package at a lower price, not at all justified by ingredient costs, cost of compounding or manufacturing.

"It is my firm conviction that we as manufacturers must do a better job of policing our industry both individually and through this association or else we will have our business regulated and policed for us.

"But through it all we can trade up, be constructive instead of trading down and being negative and destructive. We can make and market products of recognized quality and we can sell them at fair prices and make reasonable claims for them and I am sure that our industry as a whole and our businesses individually will prosper."

Secretary of the association, Ira P. MacNair, MacNair-Dorland Co., in his report told of the large number of bills relating to insecticides, disinfectants and economic poisons introduced in 44 state legislatures during the year. The majority of these bills, he said, have died but a few are still pending and the association has strongly opposed or offered amendments in the cases of three of them. He told of other government and state developments affecting the industry and said that "we feel that any restriction which will interfere with the ready manufacture of these materials (products of the members) are not in the best interests of the health and well-being of the country."

Charles B. Dunn, General Counsel, Federal Reserve Bank, Chicago, delivered an address, "The Present Monetary Situation and the Federal Reserve System."

Indications that the Army and Navy soon will take large quantities of U. S. P. cresol compound has focused attention on available supplies of necessary cresol according to a paper "U. S. P. Cresol vs. Cresylic Disinfectants," prepared by Gordon M. Baird and read by R. P. Neptun, Allaire, Woodward. "The quantities of U. S. P. cresol compound called for (by the Army and Navy) are the largest on record, approximating to date some 200,000 gallons. This would require close to 150,000 gallons of U. S. P. cresol for manufacture and such amounts of this material are not available at this time," he said.

Accordingly it has been suggested that the Army and Navy will probably be required to purchase cresylic disinfectants for their immediate needs because of the ample supplies of this product. Costs, characteristics and applications of cresol compounds and cresylic disinfectants were shown in comparison.

Reporting for the disinfectant scientific committee, Dr. Emil Klarmann, Lehn & Fink, sought approval to develop a method for testing fungicidal products used for foot baths. This method, he said, would aid in checking the spread of "athlete's foot" but he declared that the association was not interested in tests for therapeutic values of products.

C. O. Auslander, purchasing agent, Michael Reese Hospital, Chicago, told in terse terms "What the Hospital Wants in Sanitation Supplies." Included in his recommendations were: (1) that products be sold for what they are, with the ability to do a certain job; (2) that literature sent out by manufacturers be freed of unnecessary "romantic verbiage"; (3) that merchandise be sold on the basis of government standards for the products; (4) or better that merchandise be graded by its ingredients and its ability to perform.

Featured on the afternoon program of the first day's session was a question and answer clinic devoted to the industry, an NAIDM "Information Please." Directed by R. H. Young, the board of experts included Dr. A. E. Badertscher, Dr. E. G. Klarmann, L. J. LaCava and Ira P. MacNair. Discussion centered on the shortage of tin containers.

The report of Dr. G. J. Hucker, chief in research, bacteriology division, N. Y. State Agricultural Experiment Station, "Some Bacteriological Aspects of the Public Sanitation Problem," was read by W. G. Walter in the absence of Dr. Hucker.

Four years' work culminating in three methods of evaluating liquid household insecticides against the German cockroach and the bedbug was outlined in the final report of the cooperative project of the association and the Ohio State Research Foundation by Dr. F. L. Campbell, C. S. Barnhart and J. M. Hutzel, all of Ohio State University. Submitted were these methods: (1) settling mist method; (2) chamber method and (3) lard can method. Dr. Campbell recommended that the settling mist method would best serve the requirements of the industry and after considerable discussion from the floor, it was moved that the association conduct further research on

the method from a commercial viewpoint before final approval.

"Control of Household Insects with Smokes Containing Pyrethrum, Derris and Certain Synthetics," a paper by Dr. Lyle D. Goodhue and William L. Sullivan, was presented by Dr. R. C. Roark, U. S. Department of Agriculture.

Dr. Cady S. Corl, Allaire, Woodward, presented "A Twenty-Year Picture of Pyrethrum Prices and Scientific Investigations." Using charts to develop his address, Dr. Corl said that the only marked effect in connection with scientific developments in this field was the drop in Dalmatian exports. This came about, he said, when it was discovered that all Dalmatian flowers were not superior to the Japanese.

On the second day's program, first address was by H. E. Whitmire, Whitmire Research Corp., on the "Correlation Between Repellancy and Evaporation of Commonly Used Stock Spry Base Oils." C. N. Skidmore, purchasing agent for Northwestern University, in his address on "Buying Maintenance Supplies," gave as his suggestion that buyers and sellers get their hands dirty together with persons actually using the sanitation products. Under this scheme, he said, it would be easy to work for mutual solution of the problem and find the correct product for the job.

H. C. Fuller, technical consultant of the association, discussed his work in Washington, D. C., for the association and told of the preparation of the model insecticide law. Object of the law, he said, is to present some form of legislation that will cover all types of insecticides and pest destroyers, acceptable to all groups and in line with the ideas of Federal Administrators. A model bill already had been presented to some states by the Manufacturing Chemists Association, he said, but it did not take care of all types of insecticides.

The question, "Shall the Sale of Insecticides and Disinfectants Be Restricted by Law to Unbroken Packages?" was discussed by J. M. George, J. N. Curlett and H. C. Fuller.

In his report on coloration of powdered insecticides, Ira P. MacNair pointed out that the question of coloring poisonous insecticide materials as a means of preventing accidental poisoning has been included in numerous proposed state insecticide laws which have come up this year. From discussions with officials, he said, he believes that there will be constant pressure on industry to color all poisonous materials until all states have this safety requirement. General policy agreed upon by the association and the MCA in this matter is (1) that no legislation anywhere specify a definite color; (2) that the NAIDM cooperate with the MCA in aiding the general acceptance of various colors now practically standard—nile blue for all fluorides and a distinct pink for arsenicals.

In setting up these standards some health officials believe that that should go further and include many substances used in insect, rodent, and fungus control, which are not now generally colored; these include materials such as poisoned grains, mercury salts, ant syrups, sodium chlorate and other materials.

Dr. E. M. Searls, University of Wisconsin, presented a paper, "A New Method for Studying the Effectiveness of Cattle Fly Sprays."

Afternoon session of the Tuesday meeting began with a report of the work of the insecticide scientific committee given by its chairman, Dr. A. E. Badertscher, McCormick & Co. F. C. Nelson, Stanco, Inc., spoke on "New Methods of Testing Cattle Sprays."

Mothproofing work being carried out in cooperation with the American Society for Testing Materials and the American Association of Textile Chemists and Colorists was described by F. W. Fletcher, Dow, reporting for the mothproofing committee. Primary purpose of his committee, he said, was to set up a standard test for resistance of fabrics or yarns to insect pests. This test, he said, is not yet ready for adoption.

Professor Fred A. Russell, University of Illinois, gave "A Modern Slant of Marketing Problems." Highlighted in his address was the fact that for some years it has been evident that one of the weakest spots in sales management was the hiring or selecting of salesmen. He pointed out what has been done and what there remains to do about it.

Dr. Thomas L. Carpenter, Sinclair Refining Co., told of a study to determine the possibility of using household spray for plant spray purposes. It was concluded in the investigations that a spray having the base with proper specifications and which contained non-injurious toxicants could be safely used if properly applied with proper equipment. It was stressed, however, that the average consumer would not be likely to use the proper equipment or take the proper precautions, therefore, it was not deemed justifiable to recommend the production of a spray for a dual purpose at the present time. He said that future developments will change the picture but under present conditions the popularity of household sprays should not be jeopardized by recommending them for control of plant pests.

Dr. Alfred Weed, John Powell & Co., delivered the last paper of the meeting, "Deterioration of Powdered Pyrethrum."

Voted at the convention was the date and place of the annual meeting—Hotel Roosevelt, New York City, Dec. 1 and 2.

Below, taken at the convention. (Left to right), Barton G. Philbrick, Skinner & Sherman; Dr. E. G. Klarmann, Lehn & Fink and R. L. Speer, Shell Oil. Center, W. J. Zick, president of the association, Stanco, Inc. End, T. L. Carpenter, Sinclair. ***For complete page of photos of the convention see page 53.***

CHEMICAL SPECIALTY *News!*

Drug, Medicine and Toilet Preparations Industry Gets Minimum Wage Order—Boyle Adds Germicide—Paint Industries Show Set for October 27—Pharmaceutical Meeting August 17—Hewitt Soap Increases Office Space—New Higgins Name

Above, Curran Corp.'s complete decarbonizing process in package form, "Hydro-Sealed" Gunk Compound H-S. New H-S stripper decarbonizes parts from carburetors to anti-aircraft guns.

DRUG, medicine and toilet preparations industry went under order July 7 to establish a minimum wage rate of 40 cents an hour. Issued by General Philip B. Fleming, Administrator of the Wage & Hour Division, the order came out of a recommendation by a committee representative of the public and employees and employers of the industry.

Approximately 9,000 workers of 44,000 in the industry will benefit by the wage increase.

Not affected by the order are manufacturers of shaving cream, shampoo, essential (volatile) oils, glycerin and soap, or millers and packagers of crude botanical drugs.

Boyle Adds Germicide

A. S. Boyle Co., Jersey City, recently added a new item to its list of household specialties, Silver Label Brand Germicide. Product was acquired from the Keefe Chemical Co., Boston. Germicide is an antiseptic and deodorant.

Paint Industries Show

Tenth anniversary Paint Industries Show will be held Oct. 27, 28, 29, at the Drake Hotel, Chicago, it has been announced, in conjunction with the annual conventions of the Federation of Paint and Varnish Production Clubs and the National Paint, Varnish and Lacquer Association, Inc.

89th APA Meeting

American Pharmaceutical Association will hold its 89th meeting at the Hotel Statler, Detroit, August 17-23. Bernard A. Bialk is general chairman and local secretary. An extensive program of business and entertainment has been arranged toward making the convention the largest and best ever, it is reported.

Bosee on Active Duty

Roland A. Bosee, Ch.D., F. A. I. C., director of laboratories, Endo Products, Inc., Richmond Hill, N. Y., has been ordered to report to the Navy Department, Bureau of Aeronautics, Washington, D. C. Bosee, a lieutenant in the Naval Reserve, will have as his assignment work on research and development of organic and inorganic materials, inorganic coatings, synthetic substitutes and development of plastics.

Hewitt Soap Expands

Hewitt Soap Co. recently increased the space occupied by its New York office and sample rooms by some two hundred per cent. In the new toilet soap sample rooms there is a reference file of soap samples from all parts of the world, including all American manufacturers, comprising between four and five thousand brands. Main office and factory of the company is in Dayton, Ohio.

Higgins Changes Name

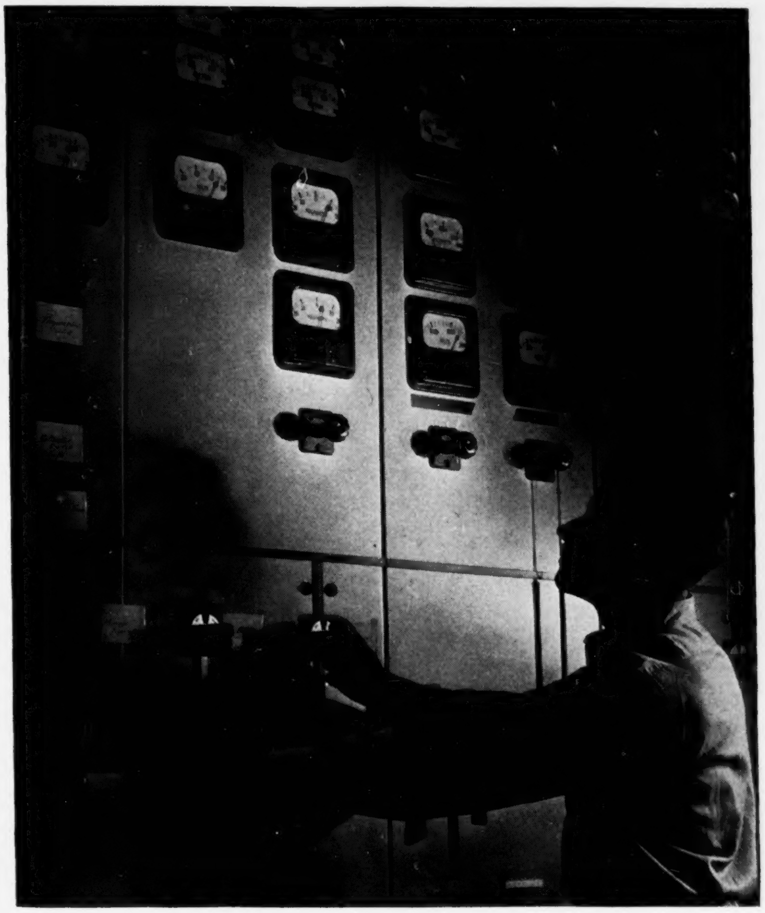
Chas. M. Higgins & Co., Inc., last month announced that it has adopted a new corporate name, Higgins Ink Co., Inc., Brooklyn, N. Y. Reasons given; to make the name shorter and easier to remember than the one used for the past 60 years.

Now Makes Insecticides

J. R. Watkins Products Co., Grand Rapids, Mich., recently stepped into the manufacture of insecticides after 70 years of manufacturing other specialty products. Included in its insecticide lineup are products for the control of animal parasites and for the control of insects that feed upon plants or annoy plants and human beings.

Above, the first plastic rowboat made entirely of du Pont's "Lucite" methyl methacrylate. Boat is 8½ feet long, weighs 96 pounds and is shown here in an ocean of "Cellophane" film.

PLANT OPERATION AND MANAGEMENT



Plastic Instrument Dials That Stay White

Westinghouse meter division is producing white instrument dials that are not discolored by high temperature, light, chemical fumes or moisture. A recently-developed liquid plastic material is used and is sprayed on metal. Foundation of dial is metal sheet given a spray of the white plastic, hardened on surface by quick heating and then dried completely by controlled baking in an electric oven. Dials shown above.

A DIGEST OF NEW METHODS AND EQUIPMENT FOR CHEMICAL MAKERS

ONE COMPANY'S VIEWS on Sampling

By Bronson B. Tufts
Hercules Powder Company

This article contains Hercules Powder Co.'s attitude toward sampling and a description of its sample package improvement and standardization. Vital to the chemical industry, this sample problem can be a boon or a six-headed monster, according to the way it is handled. Here is how Hercules has handled it.

IN considering the subject of samples we first should consider what is meant by the word "sample."

Webster defines a sample as, "A part of anything presented for inspection, or shown as evidence of the quality of the whole." Basically, this is all that can be desired, but it can serve only as a premise and, depending on your business or the industry with which you are connected, it serves only as a foundation on which you must build your own structure.

A grocer gives a housewife a bit of cheese to taste; the bit of cheese is a sample in the most elementary sense. If the housewife likes the cheese she may buy a pound.

A large manufacturing concern is fully conversant with the physical and chemical properties of a product developed recently by a chemical manufacturer. The potential user desires to make a trial of the product under actual working conditions; for this purpose five hundred pounds are needed. If the trial run is successful thousands of pounds will be used. The chemical manufacturer supplies the five hundred pounds without charge; this clearly is a sample, and between the bit of cheese sampled by the housewife and the five hundred pounds of chemical product lies a vast range of sampling possibilities.

Naturally, the grocer would not charge for a taste of cheese, but suppose the chemical manufacturer had charged for the five hundred pounds of his product. Would the five hundred pound lot, if charged for, still be considered a sample.

Webster, in his definition of "sample" says nothing about a charge, so that the various schools of thought cannot fall back on him for support. Whether, if charged for, "a part of anything presented for inspection, or shown as evidence of the quality of the whole" is considered a sample has to be determined by the one sending the "part"; individual cases must be determined on their merits.

Hercules Powder Company distributes samples of over one hundred products, and, during their recent period of sample package improvement and standardization, it became necessary to determine just what constitutes a sample. For Hercules' purposes the definition of a sample is:

> A quantity of a product, supplied without charge, sufficient for the recipient to determine whether the product is suitable for his requirements, or warrants further investigation.

The new Hercules sample packages range in size from a few ounces to five or more pounds; for liquids to five gallons. In the event of a small sale, say five gallons of a liquid product, it is entirely permissible to use a five-gallon sample container but it must bear a sales label. For products that may be sold in small quantities both a sample package label and a sales package label are provided. Sales labels differ from sample labels in that, on the former, trade mark registration and patent details are shown, which they do not consider necessary on a sample package.

Any quantity of a material charged for is considered a sale; any quantity supplied free is a sample.

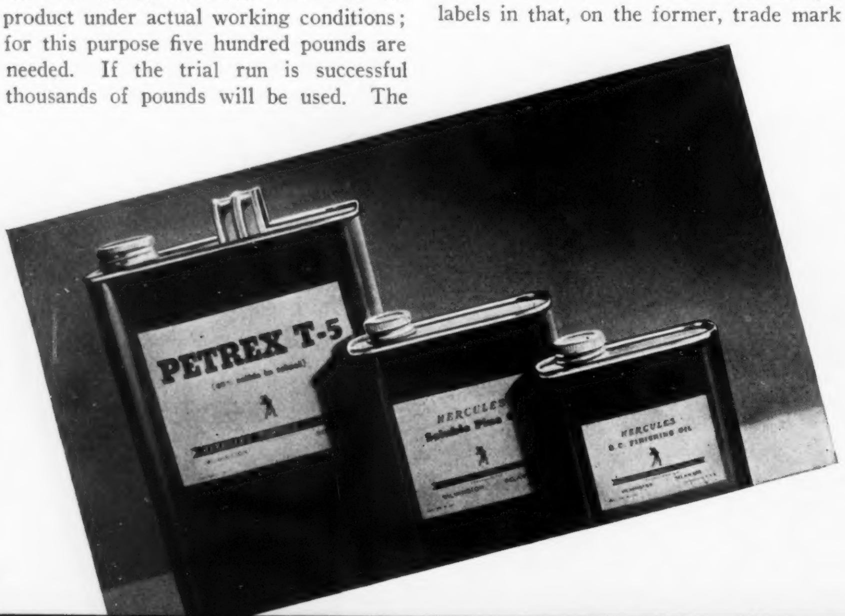
The distribution of Hercules' samples is controlled carefully. That is, they are not given out promiscuously but only, and then gladly, to reputable concerns or persons who really are interested. It can be said here that the giving of a sample is not the end of Hercules' service. Technical representatives ably assist potential consumers in the proper methods of application.

The different Hercules departments have their own systems for "following up" all samples sent out, but the two major follow-up methods are by a representative's call, or by mail.

Hercules' sampling methods can be appreciated more fully if the development of their present sampling system is understood.

Hercules Powder Company was not "sample conscious" when it started business in 1913, because it was not cusotmary to send samples of explosives to potential customers. However, during the past 28 years, the organization has grown until, today, it is a widely diversified chemical company, manufacturing many products and serving scores of industries, as contrasted with its sole production of explosives in 1913.

Over two years ago, the Hercules advertising department paused to examine the company's sampling methods. Sample packages of over 100 different products were forwarded from 27 of the more than 50 plants and offices. These are located from Massachusetts to Florida, from New York to San Francisco, from Michigan to Mississippi. An investigation was commenced to determine what sample containers were used and how they were packed and labeled. Nearly as many styles of sample packages were used as there were branches sending them out. Every department was doing its best, but, because of no centralized standardization, the sample line was extremely varied in appearance. It was a tremendous task to



Three sizes of the oblong type can (pint, quart, and gallon) adopted by Hercules for samples of some liquid products. Cans are lithographed in maroon. Printed paper labels are affixed when samples are prepared.

From left to right, the 16-ounce and eight-ounce wide mouth type, and the eight-ounce Boston round bottle. These are wrapped in sheeted cellulose wadding and shipped individually in the telescope type mailing case with the metal ends. Bottle closures are made of a maroon colored plastic.

From one to five-pound samples of some products are mailed in these telescope type mailing cases with metal ends. These telescope type cases act both as product and mailing containers. After they are filled with a product they are sealed, around the circumference.

start at the bottom and erect a new sampling structure. To revise completely the packages of a large industrial concern is an undertaking that is most revolutionary in character.

The products of four departments were included in the improvement and standardization program. These are naval stores, cellulose products, paper makers' chemicals and synthetics. Each department was taken in turn and each product of which it forwarded samples was scrutinized. The type and size of container used for each product was examined. Then products and containers for all four departments were considered together and the minimum number of container types and the sizes of each type were determined. Not only was it necessary to consider the physical properties of each product—whether it was in powder, liquid, paste, lump or solid form—but it was necessary also to consider the chemical properties of each product. Obviously a product that will be contaminated by metal must be shipped in glass or some other suitable container. Proper liners for bottle closures had to be considered because some products with penetrating properties will seep through certain closure linings.

Finally it was determined that 27 containers would comprise the standard family of packages for samples of the products: five bottles, seven cans, three drums and pails, five telescope-type mailing containers and seven corrugated fiberboard mailing cartons. This was found to be the minimum number of containers that could be utilized. The bottles are of two types: the Boston round and the widemouth type. There are two types of cans: the friction top and the oblong.

All cans and drums of the standard sample family are lithographed in one color, maroon, and all bottle closures are made of a maroon-colored plastic material. Labels were prepared for each product in sizes suitable for each container. However, to keep the number of labels at a minimum, the same size of certain labels was planned for use on more than one package. Address labels were prepared for each branch or plant forwarding samples. Ten sizes of sample package labels were the minimum number adopted. All mailing labels are of the same size. Thus a total of eleven label sizes are utilized. The result is that there are 272 standard container labels and 27 package address labels being used at the present time.

Labels for each of the four departments are distinguished by a different basic color: green, blue, orange, and yellow. All are printed in maroon ink. The labels were checked with the Hercules patent and legal departments and, because nearly all samples are mailed, the package types and sizes and the label colors and format were checked with the Post Office.

One important innovation was made in packaging samples enclosed in glass bottles. Heretofore, sawdust had been used. Many samples were received in offices where sawdust made an undesirable mess. Sheeted cellulose wadding was therefore substituted for sawdust for bottle packing purposes.

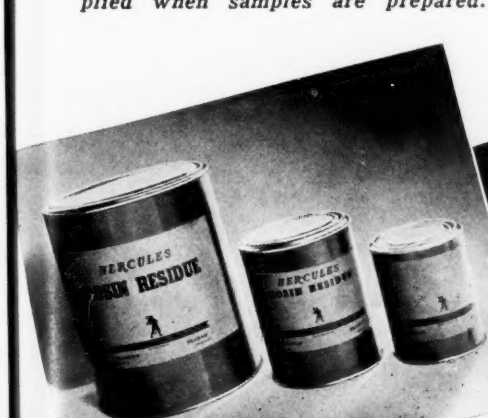
Other details to round out this sample packaging program were the preparation of a design for gummed paper tape of various widths and weights, obtaining labels reading "Fragile—Liquid" for use on the outside of packages containing samples of liquids in bottles and designing a standard shipping tag for all departments. No detail was overlooked to perfect the program.

Several products of the various departments, because of their properties or because of trade practices, were not included in the standard family. Containers for these products were improved; new imprinting designs were adopted, or new labels were prepared.

The preparation of all sample labels and the purchasing of all sample containers is now centralized at the company's home office. Stocks of standard containers are carried at the nearby Hercules Experiment Station. The branches and plants using these supplies order from these central points instead of buying their supplies locally as in the past.

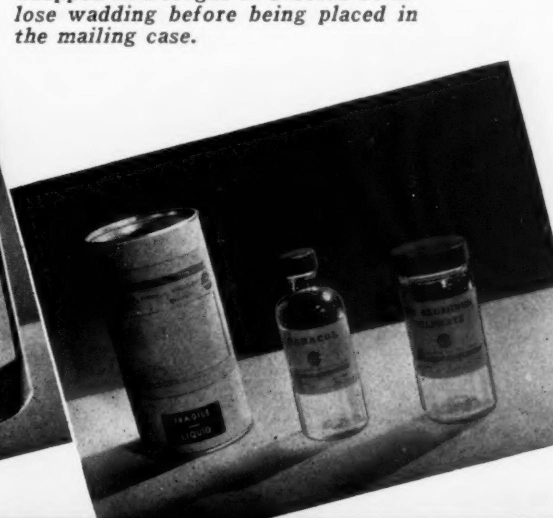
It takes time to change old and established habits, customs or systems, but the results have been exceptionally gratifying for Hercules. The new system is flexible, not arbitrary, and is subject to suggestion for improvement. Already minor alterations have been made and more are expected. It is a job that never can be considered complete. There will always be changes in old products and old policies and new products and policies will be formulated from time to time.

Pint, quart, and gallon doubletite friction top cans used for samples of some Hercules products in paste or lump form. Cans are lithographed in maroon; the printed labels are applied when samples are prepared.



Five-gallon sample containers. Left, the five-gallon open-head pail, right, the five-gallon drum. Black steel open-head pails are used; both black steel and galvanized steel drums are used.

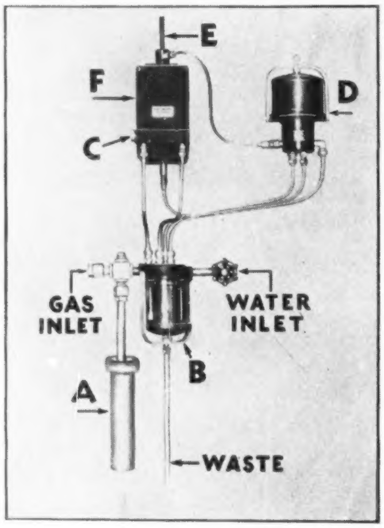
Four-ounce bottles for Hercules samples and the telescope type mailing case with metal ends. Bottle on the left is Boston round type; on the right, wide mouth type. All bottle caps or closures, are made of a maroon colored plastic. Each bottle is wrapped in a length of sheeted cellulose wadding before being placed in the mailing case.



NEW EQUIPMENT

Oxygen Recorder — QC123

Details have recently become available regarding a completely automatic Oxygen Recorder. No chemicals are used with this instrument. It operates from the electric supply line and provides continuous indication and graphic record of the amount of oxygen in any gas.



Operation of the instrument is simple. Gas is drawn into the analyser by a bubbler-aspirator B, the condensate falling into drip pot A. The aspirator maintains suction sufficient to draw a total quantity of about one liter of gas per minute through the inlet and the bubbling action also serves to scrub the sample. The gas is thus scrubbed and metered by the aspirator. At the elbow the incoming gas divides into two streams, one of which flows directly to the aspirator; this is a larger stream and acts as a line purge. The remaining gas flows through a secondary filter and orifice C, and thence to an inner bubbling tube in the aspirator. Pressure drop across the orifice as well as the flow through it, is constant. Within wide limits this flow is independent of both the total gas flow and of the restriction in the remainder of the apparatus.

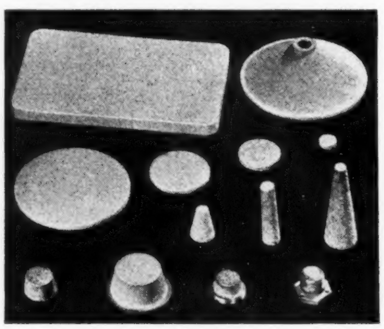
The gas sample is collected by an inner bell in the bubbler and from there it passes to one side of the analysing cell D, then flows through tube E in the furnace, back through the other side of the analysing cell and then to the bubbler aspirator where it goes to waste along with the main gas stream.

The center tube E of the furnace contains a carbon rod heated so that any oxygen in the gas passing over it is converted to CO_2. The supply of carbon in the furnace is usually sufficient for more than a week's operation depending upon the oxygen content of the gas being tested. The carbon is automatically fed into the furnace. The flow of gas is controlled at a figure which while conserving the carbon rod permits rapid response of the apparatus.

One side of the analysis cell D is exposed to the original gas containing oxygen, while the other side is exposed to the same gas, with the exception that the O_2 has been converted to CO_2. The meter unit is arranged to measure the difference in thermal conductivity between the gases on the two sides, which is obviously proportional to the oxygen concentration of the original gas. The result is not affected by any changes in the original CO_2 or N_2 concentration.

Porous Metal Filter — QC124

New Products for the filtration and diffusion of liquids and gases have just been introduced by Moraine Products Division of General Motors Corporation. Under the tradename, "Porex," they are made in various shapes and sizes from



powdered metals by a series of processing operations. The principal functions of "Porex" products are to remove foreign materials from liquids, such as oil, and to alter the characteristics of gases by diffussion, reducing pressures and controlling flow rates.

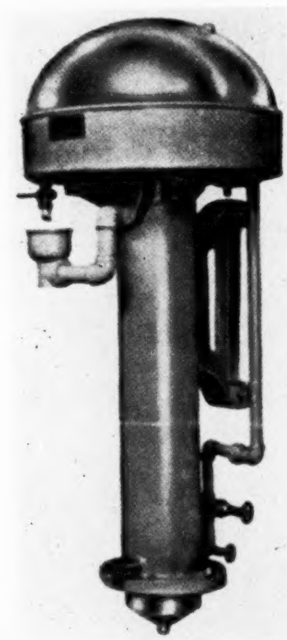
Applications of these functions are found in pumps, refrigerators, fuel lines, lubricating systems, oil burners, evaporators, absorbers, paint sprayers, premixed gas burners and other devices.

Among the advantages of "Porex", according to Moraine Products engineers, are its physical characteristics, such as chemical composition, structure, porosity, strength and ductility, which may be varied within certain limits to suit specific applications. Similar variations may be accomplished in its size and shape. Standard shapes now available are discs, sheets, cylinders and truncated cones, while special shapes also are obtainable.

Water Stills — QC125

In a catalog just published, the F. J. Stokes Machine Co. shows steam-heated, single-effect, automatic water stills, in capacities from 10 to 100 g. p. h., having a number of new and improved features to aid in production of pure distillate for laboratory and industrial purposes.

One of these features is an improved, high-speed, vapor-baffle system so designed that it greatly increases the velocity of the water vapor, at the same time reversing its direction of flow three times



between the top of the boiling chamber and the point at which it enters the condenser. It is stated that it is practically impossible for impurity-carrying particles of spray, to get through this triple-baffle and that only pure, dry steam can enter the condenser.

Another feature of these stills is a new light-weight, one-piece copper cover, readily removable by hand for inspecting and cleaning the steam-coils, boiling chamber and other parts of the still. These covers are water-sealed and thus avoid gaskets and fastenings.

These stills are said to be of particular advantage in hard-water districts being all "hard water" models, equipped with automatic "bleeder" devices to continuously remove scale-forming solid materials and reduce "foaming."

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

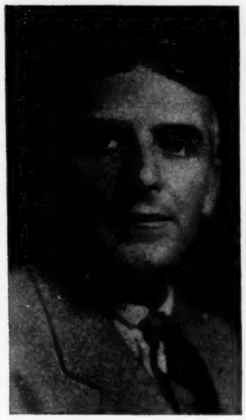
QC 123 **QC 124**

QC 125

Name ....

Title .... **Company** ....

Address ....



Shipping and Container FORUM

By R. W. Lahey

STANDARD UNITS OF WEIGHT AND MEASURE LEGISLATION PROPOSED—AMERICAN EXPORTERS WARNED ON ADEQUATE EXPORT PACKING—UNLOADING MULTIWALL PAPER SACKS—ST. REGIS RFC BAG MACHINES

DR. Lyman J. Briggs, President of the National Conference on Weights and Measures, following a recommendation of the thirty-first meeting of that organization, recently held here, has appointed a special committee of three members to seek the introduction and the passage by Congress of proposed Federal legislation to prohibit the movement in interstate commerce of packaged food other than in standard units of weight and measure.

Alex Pisciotta, Director of the New York City Bureau of Weights and Measures and active proponent of the proposed legislation, is chairman of the special committee. His associates are J. H. Meek of Richmond, Director of the Division of Markets, Virginia State Government, and George M. Roberts, Superintendent of Weights, Measures, and Markets, District of Columbia Government.

In announcing the appointment of the special committee, Dr. Briggs, who also is Director of the National Bureau of Standards, said:

"The legislation proposed by the National Conference on Weights and Measures is not an attempt to 'crack down' on manufacturers who distribute their food products in packaged form. The bill, which received the unanimous endorsement of the Conference at its recent meeting, allows all manufacturers ample time to make any adjustments that may be necessary in order to comply with its provisions.

"This bill is intended to give to the ultimate purchaser of packaged food a character of protection not now afforded by Federal or State law. It establishes mandatory standard units in which food shall be packaged. All packers would thus be placed on a par in the matter of the amounts of packaged food offered to the public.

"The Conference believes that the proposed legislation will work to the advantage of manufacturers, primarily by reason of the elimination of the unfair competition which now arises because of the many non-standard sizes in which packaged foods are offered for retail sale."

Enforcement of the proposed new law would be in the hands of the Federal Food and Drug Administration, now a part of the Federal Security Agency.

Over a period of years bacon has been sold in one pound and one-half pound packages. Yet competition has caused some bacon to be put out in 7-ounce packages. The seven-ounce package looks just like the half-pound package and enters into competition with it, and many housewives have purchased it thinking they were getting the regular 8-ounce package. The proposed legislation would not permit the 7-ounce package of bacon to move in interstate commerce. This is just one of the aims and purposes of the bill.

The standard packages proposed for dry and solid foods are: 1 ounce, 2 ounces, 4 ounces, 8 ounces, 12 ounces, 1 pound, 1½ pounds, and multiples of 1 pound avoirdupois weight.

The standard packages proposed for liquid foods and for canned foods are: 1 ounce, 2 ounces, 4 ounces, 8 ounces, 12 ounces, 1 pint, 1½ pints, 1 quart, 3 pints, 2 quarts, 3 quarts, 1 gallon, and multiples of 1 gallon, United States liquid measure.

In all cases, standardization is based on the amount of food in the container.

Under the provisions of the proposed bill all packages of food will fall into the classifications "dry or solid food," "liquid food," or "canned food." Exceptions allowed are packages of food in containers packaged in accordance with previously enacted Federal legislation, and maltous, vinous, and spirituous liquors, which do not come within the scope of the proposed legislation.

The bill would require the Social Security Administrator to promulgate regulations for its enforcement.

In order to give manufacturers time to make adjustments, where necessary, the proposed act would take effect twelve months after the first day of January next succeeding its enactment. Furthermore, if, upon investigation, the Administrator should find with respect to particular packages of food that compliance with the provisions of the Act cannot reasonably be accomplished by the effective date, he may promulgate a regulation providing for further postponement with respect to such packages.

Department of Commerce Issues Warning about Adequate Export Packing

American exporters were urged by the Department of Commerce to devote more attention to packing. Poor packing is not only uneconomical but may result in permanent injury to the export trade of the country, it was said.

Complaints concerning poor packing for export are reaching the Department regularly. Packing of merchandise for shipment abroad has been steadily improving in recent years but more rigorous efforts in this direction are needed to strengthen the export position of the nation, according to the Department.

Poor packing is particularly noticeable in shipments to some Latin American countries where geographical location presents formidable obstacles to delivery. American foreign service officers stationed in Bolivia have recently reported some major instances of poor packing of shipments to that country.

It is especially necessary that shipments to Bolivia be well packed since they are subjected to much handling before reaching the land-locked Andean Republic, it was said.

Arica, Chile, and Mollendo, Peru, are the chief ports of debarkation for Bolivia. Lighters are employed at these ports for unloading from ocean steamers and packages frequently hit against the ship's side while being landed, the foreign service officers reported.

From these two seaports merchandise destined to Bolivia are carried forward by mountain railway. If the Mollendo route is used, shipment is by steamer across the great Lake of Titicaca.

Shipments from the United States frequently arrive in La Plaz, capital of Bolivia, with losses as high as 50 per cent. as the result of pilferage, breakage and assorted kinds of damage. Groceries, drugs, liquors and similar articles are particularly likely to suffer from poor packing, according to the Department of Commerce.

Inconvenience and dissatisfaction on the part of the foreign purchasers and a possible impairment of the American competitive position are envisaged by officials of the Department of Commerce as a result of the failure of some shippers to maintain the customary high standard of American export packing.

Recognizing the need for informative material pertaining to export packing the Department recently issued a study which considers design of containers, correct methods of packing, packing for lowest

customs charges, prevention of rust and moisture damage, prevention against pilferage and other phases of packing.

Titled "Modern Export Packing," copies of the study may be obtained from the Superintendent of Documents, Government Printing Office, at $1.00 each.

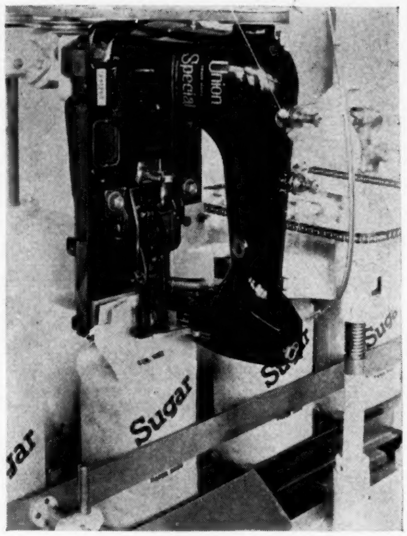
Unloading Multiwall Paper Sacks

COMMENT: In collaboration with the Paper Shipping Sack Association, this Section will publish from time to time, information and suggestions on proper carloading and handling of multiwall paper bags. There follows the first suggestion from this Association prepared by the Jaite Company.

Shippers of products packed in multiwall paper bags are extremely careful to properly condition sides and floors of box-cars by removing all nails and screws or any other sharp protruding objects that are apt to puncture or tear holes in the sacks. Sides and floors of cars are then usually covered with heavy paper to prevent chafing of sacks in transit. In spite of these precautions, there may be instances where nails or other sharp objects work their way through the car floor, resulting in punctures or tears in one or more of the sacks resting directly on the floor of the car.

Consignees should instruct their unloading crews to turn over and examine for possible tears all bags on the bottom tier before they are lifted up. If a sack is found damaged, it may be carried, with torn side up, or set aside without loss of material. Shippers usually place a number of empty sacks in every car for resacking torn containers. The torn bags are slipped into these refill bags and they are usually closed with string.

This practice is used by many unloaders and may be adopted by others with profit.



The Closing Operation.

St. Regis Machines for Filling and Closing Paper Bags

The St. Regis RFC Filling and Closing Units are high production machines for filling and applying the Sewntop closure to 2-lb., 5-lb. and 10-lb. paper bags.

In operations where there is large production, the 100-RFC is available for 2-lb. packages, the 150-RFC for 5-lb. and the 200-RFC for 10-lb. bags. These machines are designed for use with power-driven scales.

These machines, depending, of course, upon the capacity of the scale, have a production of 30 to 35 5-lb. bags, or 25 to 30 10-lb. bags per minute but are not convertible from the packing of one size to the packing of another.

In cases where one machine cannot be kept operating at capacity on a single size, the 300-RFC has been designed to handle either 5- or 10-lb. bags. It is of the same general design as the others, the difference being that the bag forming units are interchangeable for the two sizes of bags. The scales used with this unit must, of course, be arranged to supply either 5-lb. or 10-lb. charges as required, and the rate of production is somewhat slower.

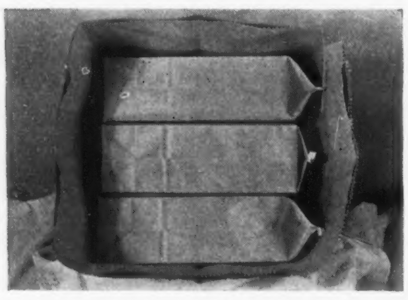
All of the St. Regis RFC machines require a 2 h. p. motor.

These machines require but one operator to slip the bags on the forming spouts of the filling unit. As this unit rotates, the bags are pulled up around the form, filled and discharged between pushers attached to a conveyor. While on this conveyor the bag passes over a vibrator which settles the contents, the gussets of the bags are tucked in and the mouth of the bag is properly formed, ready for closing. The closure is effected by a sewing unit which sews through paper reinforcing tape 5/16" wide that is applied to both sides of the bag. The excess length of the bag protruding above the reinforcing tape is trimmed off and the tape itself is clipped ¼" from each edge of the bag to complete the finished package.

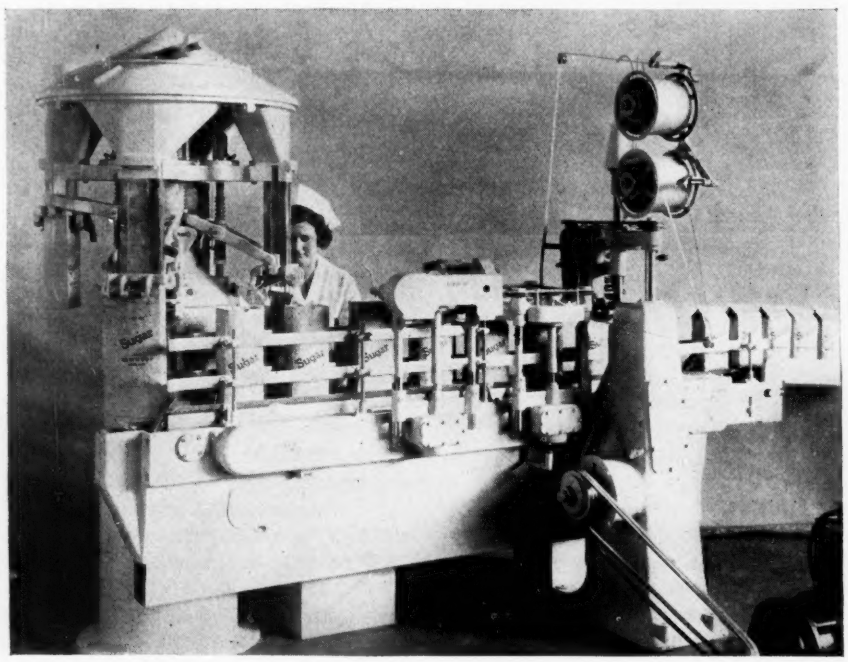
The manufacturer claims certain advantages for the sewn closure of these small bags, such as greater strength, freedom from the possibility of glue contamination of the product and greater convenience for the consumer in opening and pouring.

In actual production, the completed packages are conveyed to a packing table, where the small bags are placed in multiwall shipping containers. In the sugar trade, these shipping containers carry 30 2-lb. bags, 12 5-lb. bags or 6 10-lb. bags. The containers are filled by hand, or if

(*Continued on page 86*)



Each multiwall container holds thirty 2-lb., twelve 5-lb. or six 10-lb. Sewntop paper bags.

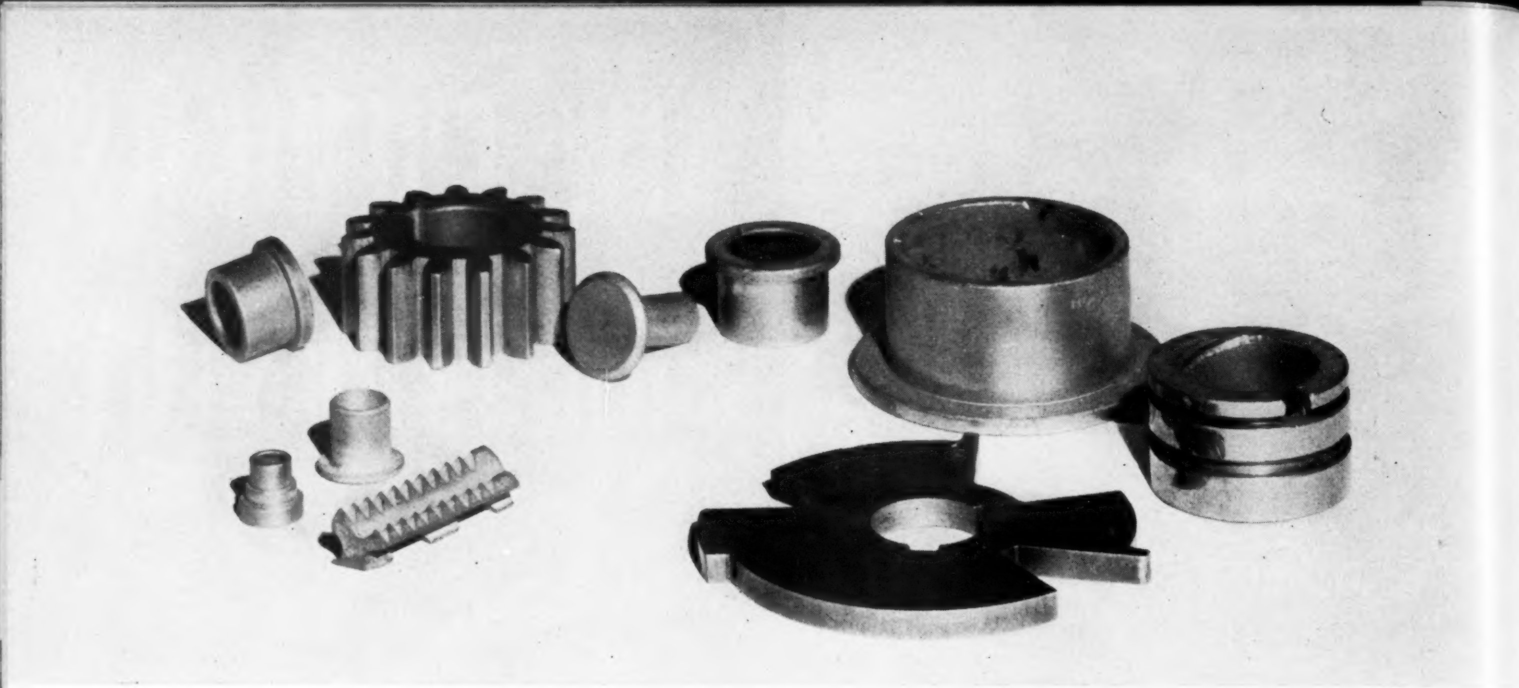


Machine Packing Sugar Into 5-lb. bags.

NEW CHEMICALS FOR INDUSTRY

Additions of Vinsol Resin by cement manufacturers to the clinker during grinding almost completely eliminate surface scale and greatly reduce progressive scale, recent experiments have shown. This photo shows the first screeding operation and uniform consistency and absence of segregation in front of the screed in cement treated with 0.03% to 0.04% Vinsol Resin on a recent test.

Digest of Chemical Developments in Converting and Processing Fields



Some parts made from metal powders and used by General Electric Co. Included are iron powder gear, cam, bushings; carboloy grinder and three bronze bushings.

POWDER METALLURGY

By Walter J. Baëza

Pres., Industrial Research Co.

Modern powder metallurgy is fast becoming a major factor in the fabrication of precision parts. The author is the inventor of a carbonyl process, has offered a solution to the "bridging" problem, and created the ceramic iron radio core and the process for its manufacture.

CLASSICALLY it may be said that powder metallurgy dates from 1829 when Wollastan made malleable platinum by compressing ground platinum in a kind of toggle press, heating the compact he so formed in a reduced atmosphere and subsequently hot forging. The modern powder metallurgy technique is essentially to compress metal powders into compacts, sinter these compacts in a reduced atmosphere and further work the sintered ingot when necessary. Wollastan's work was the fore-runner of modern powder metallurgy; it was the first of a number of sporadic experiments employing the general principles. It did not initiate the extensive developments which began nearly a hundred years after his classic experiment.

The large scale commerical production of tungsten wire about 1919 and of porous bearings a few years later introduced a new method of manufacture to the metallurgist. The characteristics of tungsten made it an ideal material for use as an electric lamp filament but the working of this element into fine wire called for a solution of problems beyond the scope of conventional metallurgy. When finely divided tungsten powder was compressed and heat treated at temperatures well below melting point, ingots were formed which could be drawn into wire less than one thousandth of an inch in diameter with a tensile strength as high as 590,000 pounds to the square inch. Here was something that stimulated the scientific imagination. Perfect welding had been obtained far below melting point temperatures. Interphase cohesion was even greater than could have been anticipated had classical fusion methods assured interlocking crystallization. Since then, with accelerated rapidity, other examples of this phenomenon have been observed, but we still await an adequate theory which will account for, much less predict and measure, the force that holds together discreet metallic particles.

Employs Metal Powders

Modern powder metallurgy employs metals or alloys with or without nonmetals in a finely divided condition to produce metal, or metal-like, forms well below the temperature of fusion. The statement must not be considered an inclusive definition. Certain products have been fabricated by the powder technique which cannot properly be considered metallic. Further, there can be no powder metallurgy without suitable powders.

Metal powders have been produced from earliest antiquity, primarily for decorative purposes. The end of the nineteenth century records the production of metal powders as catalysts. But powders made specifically for powder metallurgy are an integral part of the newer processes and products. Already a list of the powders made commercially would read like a list of the known metals, and those in extensive use are available in a great many types.

Unfortunately the industry is woefully lacking in sufficient knowledge to specify its precise requirements. Nor, even for relatively long established processes, is the producer of powder in a position to recommend with any great certitude for its peculiar properties, the particular powder best suited for a special purpose. The truth is that only very vague hypotheses are held regarding the effect of various characteristics upon product and processing procedure. It might not be too strong to say that we do not even know, with assurance, what characteristics to examine in order to classify a powder. In general there are certain ideas, too questionable to be called theories, regarding purity, shape, size and distribution. Shape is defined in only most general terms. Many of the powders pass one hundred per cent through a 320 mesh screen. For particles less than forty microns, methods of determining size and distribution are both tedious and inaccurate. Direct microscopic count is far from satisfactory. Other methods depend on Stoke's law for falling bodies, and even were these not open to serious objection

on other counts, they could at best yield only approximate values. Stoke's law applies to spherical particles, not the irregular shapes under examination. A phenomenal advance in the entire industry may be expected when comprehensive intelligent specifications can be formulated, and quick accurate methods for determining these become available.

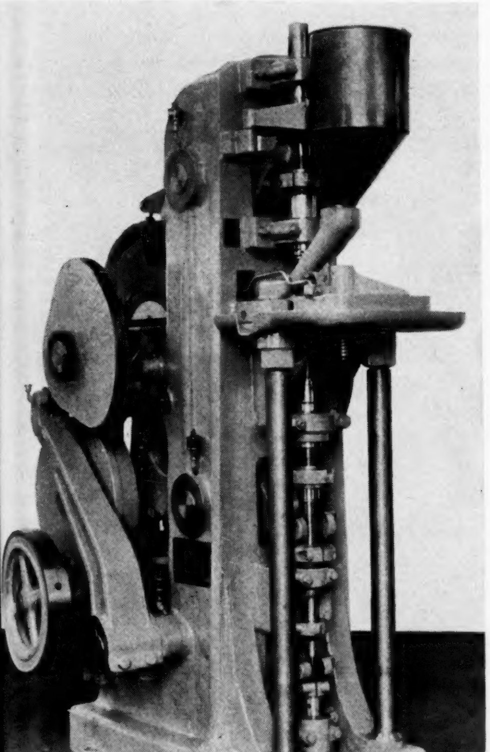
Despite this major handicap, powder metallurgy has made great progress by almost purely empirical means. The products coming from its plants meet rigid and exacting specifications. Within amazingly close limits, often without any finishing operation, parts are made to size and shape. One manufacturer makes parts over three inches long within one ten thousandth of an inch deviation from specifications. Rejections at the inspection tables for reasons of length are entirely unknown. Another produces contacts to a tolerated variation less than twenty-five hundred thousandths of an inch. Such accuracy is but one of the reasons for employing powder metallurgy techniques, but it is an extremely important one.

It is entirely in order to inquire into the reasons and the economic logic which makes it sensible to spend energy disintegrating a metal ingot into millions of fines, and then more energy to recombine these particles back into solid form. The ease and assurance with which small parts can be formed with great accuracy to precise measurements in a single operation, partly answers the enquiry. There are many instances which demonstrate that the expenditure of relatively *unskilled* man-power-hours for disintegrating, recompounding and finishing small metal parts is more than compensated for by the *skilled* man-power-hours otherwise required to reduce a crude shape to size within close limits of variation.

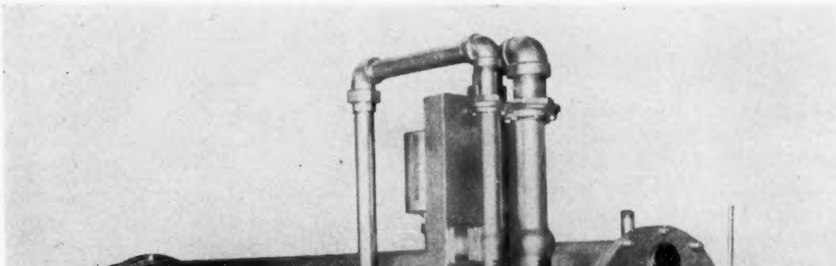
An outstanding example of this is found in the gear pumps used to circulate the oil in one line of General Motor cars. This pump is essentially a pair of gears which rotate in a housing. The gear teeth are made true involute curves. The gears must be accurately formed in order to avoid noisy operation or binding and yet secure positive pumping action. Anyone who has studied the mathematics of gear design knows how close to the theoretically correct design each tooth must come if such a pump is to perform the work for which it has been planned. Only highly skilled machinists can be trusted to make these parts from die castings. But any workman can turn out hundreds of gears with greater accuracy than the best machinist can produce a few, by merely keeping the hopper of a compression molding machine full of powdered iron, and putting the molded part on a continuous belt which carries it through the heat treating operations. A finishing operation which requires but minor skill and removes but a few thousandths of an inch of excess metal, is all that is required to complete the part.

But the story of this gear is not completed by citing its savings in skilled labor, nor in enumerating a number of qualities in which it excels a machined part. In cutting a machined gear from a cast blank, sixty-four per cent of the blank is removed in chips; only thirty-six per cent of the blank is in the finished gear. Said F. V. Lenel of the General Motors Corporation, reporting at a Massachusetts Institute of Technology powder metallurgy conference, in 1940: "This saving in raw material is one of the factors why the molded gear is not only superior in quality, but also lower in production cost than the cast and cut gear."

For similar reasons, powder metallurgy has been preferable to conventional methods of manufacture for the production of small permanent magnets, such



Above, "S" press of the Stokes Machine Co., 30 tons capacity. Pressure is applied from both above and below. Secondary lower punch and stationary core-rod are shown on this model.



General Electric combustion-type furnace-atmosphere controller, for reforming city gas, natural gas or butane for use in electric furnaces. Used for annealing process under controlled conditions described in this article.

as Alnico magnets. Indeed Alnico cannot be cast nor worked in such small sizes, as required, and powder metallurgy is essential for their production. Great savings are effected when very high purity is essential, for there is no possibility of slag inclusion either within the product or at the surface. It has been found economical to make composite metal parts. It is possible to produce moldings of several layers, each of a different metal or alloy. Valve seats are made of such composite type, with the face of one metal and the body of the valve of another, each selected for the special service it must perform.

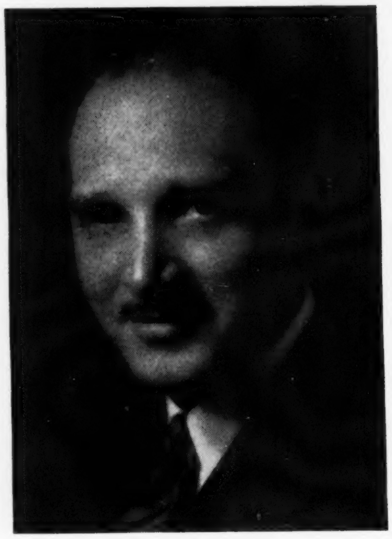
With the national defense program badly in need of skilled machinists, it is well to consider if a part that is now being made on a lathe and consuming many hours of a machinist's time, can be produced by powder metallurgy. If it can, and the manufacturer adopts the newer process, he will release skilled men for employment where molding will not serve. At least one college in the metropolitan area is planning a course in powder metallurgy as a contribution to national defense.

Reasons have been discussed why molding has taken the place of conventional methods, but there are products of the newer art for which no choice is possible. These fall into several distinct classes. Oldest is that in which the melting point of the metal is too high to permit fusion on an industrial scale. Next there are the products in which the internal structure between the crystal faces must be controlled. Then there are products, which, made of two or more metals or alloys, are required to retain the essential individuality of each, individuality that would be lost in a fused alloy. Another classification is that which includes products made of metals with very disparate melting points, or of those completely immiscible. Finally, there are radio parts with specifications which cannot possibly be met by conventional methods.

Has Solved Many Problems

Tungsten, melting at 6100 degrees F., Tantalum melting at 5100 degrees and Molybdenum with a melting point of 4700 degrees F. present nearly insurmountable difficulties to fusion treatment. The difficulty of designing equipment that will serve at these high temperatures, and of finding linings which will resist them is very great. On the other hand, the problems they present to powder metallurgy have been met successfully. In general it may be said that wherever a highly refractory metal or alloy is to be made workable, the newer process should be studied to learn if it will not prove more feasible, cheaper, and produce a more uniform, purer product than conventional methods.

Under the classification of those products in which internal structure must be controlled come the porous bearings.



These are one of the earliest products of this art. Made by sintering compacts of powdered copper, tin and graphite, today their porosity can be controlled within a fraction of one per cent over a wide range from a fraction of one per cent to forty per cent. They are easily finished to precision, if not by molding, by forcing them through dies. Oil is forced into the pores and held by capillary attraction. It is said that under heavy load the principal wear on shafts in conventional bearings comes in the first moments of use, before the lubricant can form a perfect interphase. Even if it be discovered promptly, once a bearing has run hot, much damage is done before the lubricant again functions properly. Such damage is progressive, so that if early damage of even a slight nature is avoided, the life of bearing and shaft is greatly extended. With porous bearings the oil gives perfect lubrication from the moment of contact. Heavy loads and hot running tend to cause a more rapid flow of oil as a direct effect of load and heat on capillary attraction. Small molded bearings made to precision sizes have become an intimate part of modern living. They are used in electric clocks, refrigerators, vacuum cleaners and a host of other household conveniences and liberate the housekeeper from any need to make periodic inspections with an oil can, or to keep oil cups full.

In this field of bearings, as well as in the valve seats previously mentioned, advantage has been taken of the ability to combine several metals in discreet layers. Bearings for automobile engines are made in which a porous layer of bronze, monel metal or some other porous alloy is directly bonded to a backing of such a metal as steel. The porous layer may be loaded with oil, or the capillaries may be filled with molten lead.

In the hard cemented carbide tools we have examples utilizing the essential properties of more than one metal or alloy. Particles of the carbides of Tungsten, Tantalum, Titanium and Columbium, either alone or in combination with one or more of the others, are cemented together with powdered metallic nickel, iron or more frequently cobalt. Here the bond is employed because of its strength and the carbide because of its great hardness. Other examples, appearing at an accelerated pace, are to be found in a variety of grinding wheels. One that has been available for some time is the diamond wheel made of metallic particles and diamond particles molded to form a homogeneous aggregate. Diamond wheels are also made, consisting of a metal central disk with an annular band of diamond grains bonded to the metal by powder metal technique.

As an example of that class of products which can be produced by combining powders only, since their disparate melting points or total immiscibility prevents alloying, we find contact points. Some of these are made of tungsten and copper, some of tungsten and silver, some of tungsten and molybdenum. And there are other combinations. In these the high resistance to arc temperature of the one metal has been combined with the high conductivity of the other to form a product

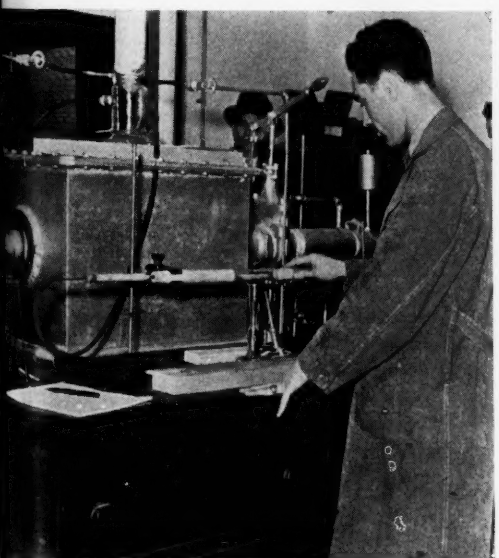
Above, Rockwell Hardness Tester and torsion balance. Courtesy, Stevens Institute of Technology (N. J.)

retaining the valuable characteristics of each. For much the same reason it has been found advantageous to make a superior welding rod by powder metallurgy technique. In these, a high fusion point metal is combined with zinc, nickel silver or copper. A very new product of great interest is a resistance element of copper with porcelain, which has a resistance of 140, if the resistance of Nichrome be considered 100.

Among the early applications of the newer technique was its use for the production of radio parts. In radio construction the ability of designers to find com-

binations of characteristics unattainable by orthodox methods has made it possible to introduce entirely new designs into radio equipment. A very new design employs a combination of powder metallurgy parts to actuate the automatic landing of planes by radio beam control. That the properties of such parts are unique and unobtainable by fusion becomes evident if we consider the properties specified for one of them. In this instance the powder metallurgist has been called upon to produce a product having all the properties of high grade iron at radio frequencies, and the properties of a good ceramic insulator at power frequencies. It must actually operate under both conditions at one and the same moment. It is a small part which must have all the permeability of a high grade iron magnet, and hysteresis losses lower than anything known to ingot iron. It must be extremely sensitive to frequencies in the radio range, tuning accurately from 500 to 17,000 cycles, and at the same time, at alternate current frequency, or with direct current, it must insulate against 230 volts, between points one ten tenth of a millimeter apart. It is difficult to believe that any approach but by powder metallurgy technique would have met with even partial success.

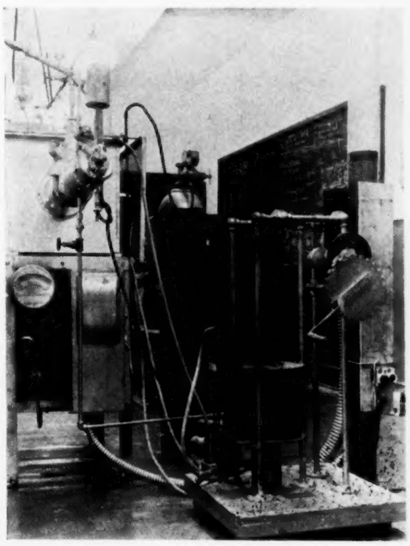
So far only products of the art have been considered in any detail. Space does not permit a full discussion of powder manufacture, nor equipment required for pressing and heat treating. As to the first, powders and powder mixtures are marketed by a number of companies. A great deal of progress along this line cannot be expected immediately, for it is probable that this department leads all



Above, demonstrating the principle of reducing tungsten trioxide to metallic tungsten powder. Courtesy, Stevens Institute of Technology.

others. More powders are made than users can as yet employ. The most recent development is the manufacture of alloy powders, which are said to have certain advantages over mixtures of pure metal powders. As has been said, the weakness in this department is in knowing how to specify the properties required to achieve products with definite characteristics. The next few years will, no doubt, show progress in analytical methods, and the development of hypotheses which will help to cut the time now consumed by trial and error attacks on problems. For some time there had been fear that the war which has cut off the supply of Swedish sponge iron and of iron reduced from iron carbonyl might handicap American production. Now it seems certain that American ores are available to take the place of the imported ones, and several companies are considering manufacturing carbonyl. If American manufacturers find no other way of making some of their products than from carbonyl iron, processes are available to make its production in this country assured.

Equipment for heat treating has made rapid strides in the last few years and will no doubt continue to do so. Heating

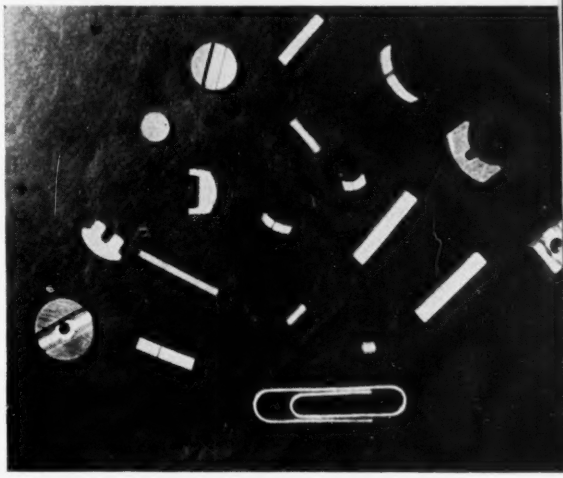


Above, hydrogen sintering furnace with choke coil control. Courtesy, Stevens Institute of Technology.

by induction and in electric furnaces of the resistance type are replacing older heat treatment methods, for they allow better temperature and atmosphere control. Such methods must develop in close harmony with methods for producing proper reduced atmospheres at reasonable costs. The products of partial combustion of hydrocarbon gases are most commonly used. Both hydrogen and dissociated ammonia can be employed, but products of partial combustion of hydrocarbon gases are most commonly used as sintering-furnace atmospheres, because of the good results obtained and the low cost of the gas and its producing equipment. Vacuum sintering is beyond the experimental stage for production of tantalum. An interesting process, it would appear too costly to operate for cheaper products, but the future may prove this impression premature.

Excellent machines are on the market for producing small parts to exact size and density at the rate of up to 200 a minute. But there are certain limitations as to the size of the part that can be made on automatic compression molding machines. Pressures well over forty tons to the square inch are often called for, and pressures of more than twenty tons per square inch are in quite general use.

It is obvious that enormous machines would be required to produce parts of



Above, some of the small Alnico magnets made and used by the General Electric Co. Paper clip is included to show size of the magnets.

very large area. Automatic machines for really large parts are not yet available.

The problem of making dies to meet the heavy wear upon them is being met with reasonable satisfaction. But complicated shapes meet difficulties inherent in the use of powder. Powder will not flow like a liquid to fill all spaces uniformly. The problem of bridging when a deep narrow die is used is a serious one. When a fine powder starts to fill a small orifice it tends to plug near the top and leave spaces between the plug and the bottom of the mold. Since molds are filled volumetrically, and the plungers move until a definite pressure is reached or through a definite distance, any irregularity in fill results in the production of parts of different size or different density. However, this problem has been met and fully overcome by one firm, and will probably be solved by others.

It must be said in closing that powder metallurgy is an expanding field. Dramatic as have been some of its accomplishments, they have been achieved in the infancy of a development which, in maturity, promises to become a major factor in fabricating precision parts with a facility and with characteristics unattainable by any other process.

New Products and Processes

By James M. Crowe, *Assistant Editor*

A NEW lubricant named "Caloria" has been introduced by the Colonial Esso Marketers. It is intended for applications where problems of operating at high temperatures are encountered. When working under intense heat, such as is found in kiln cars, glass making machinery, ceramics and glass molds, annealing and baking ovens, working parts of die casting machines, and various hot parts of industrial machinery the new lubricant evaporates slowly but completely and leaves no residue.

The new product is available in several viscosities ranging from a light-bodied water-white liquid to a viscous, slightly turbid liquid which requires more than eleven hours for two ounces to flow through the orifice of a viscosity measuring device.

In addition to its ability to disappear completely under high heat, "Caloria" has another advantage. Instead of spreading over many times its original area when dropped on a surface heated to over 400°F., it spreads to only four or five times original area, indicating that it will remain in a greater quantity on hot bearing surfaces.

For use where the lubricant cannot be re-applied before complete evaporation takes place, as in some cases of kiln car bearings, the use of "Van Caloria" which incorporates colloidal graphite, will cause the deposition of a dust-thin layer of graphite to remain and prevent metal-to-metal contact until another supply of lubricant reaches the bearings.

Cyanamide Without Carbide

Apart from its original and established value as a fertilizer, calcium cyanamide has recently acquired importance as a source of melamine and other conversion products. The manufacture of cyanamide depends upon the preliminary availability of calcium carbide, and the absence, so far, of a carbide industry in Great Britain precludes the war-time possibility of a British cyanamide industry; whilst, even under peace-time conditions, it is doubtful whether it would be economical to import carbide for conversion into cyanamide. These considerations lend much more than usual interest to an alternative route to cyanamide now under investigation in Japan. This route depends upon the treatment, at high temperature, of calcium carbonate, or of calcium-magnesium carbon ate, with a mixture of ammonia gas and carbon dioxide. The preliminary experiments were carried out with finely ground pure calcite crystals heated at 800° C. Under these conditions, a 92—94 per cent. conversion to calcium cyanamide was obtained when the gas used was 95 per cent. ammonia and 5 per cent. carbon dioxide. When, however, the experiments were extended to ordinary ground limestone, considerably lower cyanamide yields were obtained, the loss being eventually traced to the adverse effects of the small quantities of free ferric oxide present in the limestone and which decomposed the ammonia into nitrogen and hydrogen. Work is now proceeding with the object of restraining this action, preliminary results pointing to the value either of adding calcium sulfate or sulfide to the limestone, or of including small quantities of carbon bisulfide or hydrogen sulfide in the gas mixture used. Ground dolomitic limestone has been found to be susceptible to this cyanamide conversion, but ground magnesite failed completely, no trace of magnesium cyanamide being found in the processed material. The investigations are due to S. Nagai and G. Yamaguchi, of the Institute of Silicate Industry, Imperial University of Tokyo.—*The Chemical Trade Journal and Chemical Engineer*, May 2, 1941.

Flameproofing Compound

From Glyco Products Co., Inc., comes news that flameproofing of textiles, paper, wood and other porous and fibrous materials can be obtained by the use of Flameproofing Agent 361, a new type of flameproofing material. This product is an odorless, water-white liquid, non-toxic and non-irritating to the skin. It mixes readily with cold water in all proportions. It is particularly recommended by the makers for flameproofing of cotton goods, paper, etc., where the elimination of afterglow is an important factor.

Among interesting features claimed for the material is that it does not dust off, and that it is non-hygroscopic, so that materials treated with it do not become damp or sticky in humid weather, nor harsh and brittle in dry weather. It is said that tests made with this product, on a number of different kinds of textile and paper materials, showed that Flameproofing Agent 361 causes no reduction of tensile strength.

In general, about 20% of Flameproofing Agent 361 can be used with 80% Water, dipping the goods into the cold solution for a few minutes, then wringing and drying in the usual way. The solution can also be sprayed, if that method of treatment is desired.

Flour Bleaching Process

A new and more efficient bleaching agent for flour, chlorine dioxide, was described by Dr. Charles G. Ferrari of the General Mills Research Laboratories, at a meeting of the American Association of Cereal Chemists held at Omaha on May 21.

The new agent is a gas with active bleaching properties and is prepared by electrolyzing a solution of sodium chlorite and sodium chloride. It can also be generated by reaction between chlorine and solutions of sodium chlorite. Sodium chlorite is the new chemical recently developed by the Mathieson Alkali Works, Inc.

In their report, the General Mills research men state that chlorine dioxide is an efficient color remover and will oxidize the "carotene" in flour more readily than the usually employed materials. It also exerts a maturing action on certain flours, producing a dry, easily handled dough and improving the grain and the loaf volume of the bread. Its bleaching action is instantaneous.

To preserve the keeping power of the flour, more than 2 grams of chlorine dioxide per barrel should not be employed. In most cases, this amount will bleach satisfactorily without the use of other bleaching agents, but when further bleaching action is required, it can be obtained by using benzoyl peroxide in addition.

Synthetic Lauric Acid

Lauralene is a lauric acid of low titre, synthetically made. The following set of specifications makes it suitable for many uses such as soap making, plastics, specialties, wetting agents, cosmetics, hair shampoos, rubber compounding, special mould lubricants, etc.

Acid Number	324
Saponification Number	366
Percentage Unsaponifiable	0.2
Lovibond Color (6" Cell)	
Red	6.6
Yellow	29

Emulsion Base

Kem Products Co. has announced "KEMulsion Base AA", a new base for blending with essential oils and aromatics to make them soluble or self-emulsifying in water. The new product is a clear liquid of oily consistency, almost water-white, practically neutral and odorless. It forms a brilliant liquid mixture with essential oils and aromatics by hand stirring at room temperature. These blends then dissolve or emulsify spontaneously in water to form clear or colloidal solutions or white emulsions.

Chemical Salesmen's Golf Tournament

About 80 members and guests of the Salesmen's Association of the American Chemical Industry participated in their initial golf tournament of the season at Bonnie Briar, June 10. Charles Alexander, Seldner & Enequist, won low gross prize and Henry Herrmann, General Dyestuff, took low net honors.

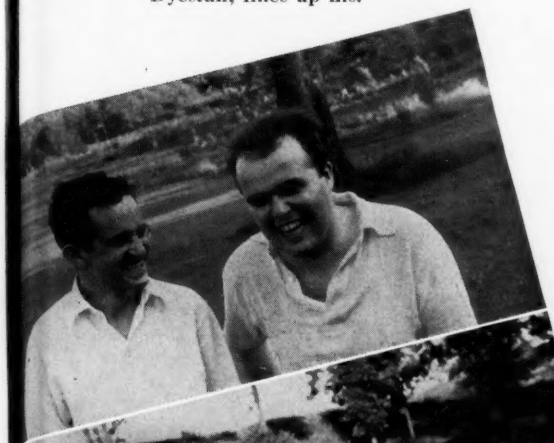
Frank G. Fanning, Malstrom & Co., finishes his last putt, as Henry F. Herrmann, General Dyestuff, lines up his.

Top photo, left to right, Russ Boland, Drug Trade News; Henry F. Herrmann; Frank G. Fanning; and "Vic" Williams, Monsanto. Center, Jim Cudahy, R & H division, duPont; Nelson Myers, Enequist Chemical; R. A. Nelson, American Agricultural; and Buddy Gore, Enequist. Bottom, Walter Burgess, Wm. S. Gray; Jack Henry, Joseph Turner & Co.; Harold W. Feuchter, J. T. Baker; and Jack Seidler, Whittaker, Clark & Daniels.

Below, Jack Remensnyder, Heyden Chemical, waits for late starters to finish up on the 18th green.

H. B. Sliger, Commercial Solvents, at the 18th green.

Charles Alexander, Seldner & Enequist, helps total scores after finishing his round of the day. (He took low gross.)



Top photo, J. R. Fisher, Millmaster Chemical, and D. L. Prior, Prior Chemical. Below that (L. to R.), J. J. Butler, Jr., Industrial Chemical Sales, West Virginia Pulp & Paper; Irving Behrman, Var-Lac-Oid; Gordon Ziegler, and Cal O'Brien, Allied Asphalt. Below that, Lester E. Camp, Columbia Chemical; and W. Gasteiger, Warner Chemical. Bottom, H. F. Zimmerman, B. T. Heffern, (International Selling Corp.) and J. F. Hollywood, E. S. Burke Co.

Right, George A. Bode, R & H Division, duPont.

Newest Thing in Tank Cars

Marking a new stride in railroad transportation, the American Car and Foundry Co. has just rolled five tank cars with all fusion welded nickel-clad steel tanks out of its shops at Milton, Pa. These are the first all-welded units of this type (Class, I.C.C., 103) and are designed specifically for carrying a variety of corrosive chemicals and products whose color and purity must be protected. Because of this CHEMICAL INDUSTRIES made an inspection trip to the Milton shops and now presents a pictorial report.

At the right is one of the new cars ready to be delivered.

The development of the new cars was mainly in the hands of four companies who were represented on the inspection trip by, above, left to right: W. P. Hindman, Works Manager, Milton Plant of A. C. F.; Dr. W. G. Theisinger, Director of Welding Research, Lukens Steel Co.; Frank G. Flocke, Welding Engineer, International Nickel Co. and below, left to right: J. D. Seiler, General Superintendent, Milton Plant of A. C. F.; Norman G. Schreiner, Welding Engineer, The Linde Air Products Co.

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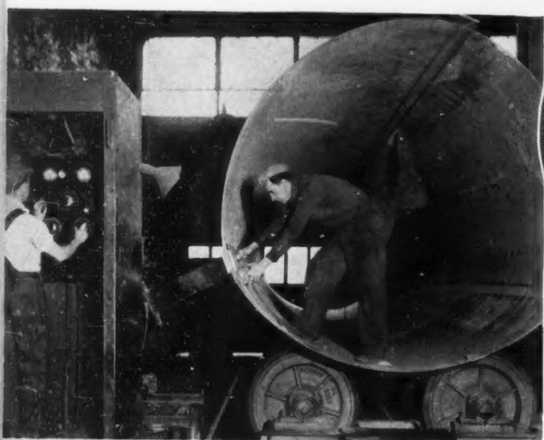

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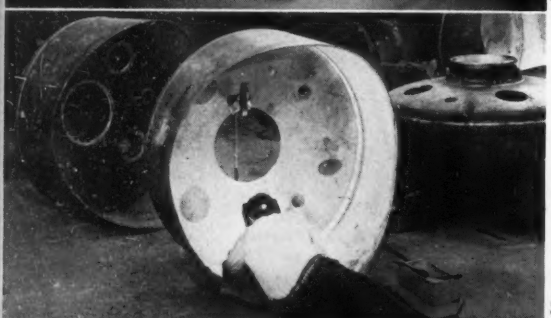

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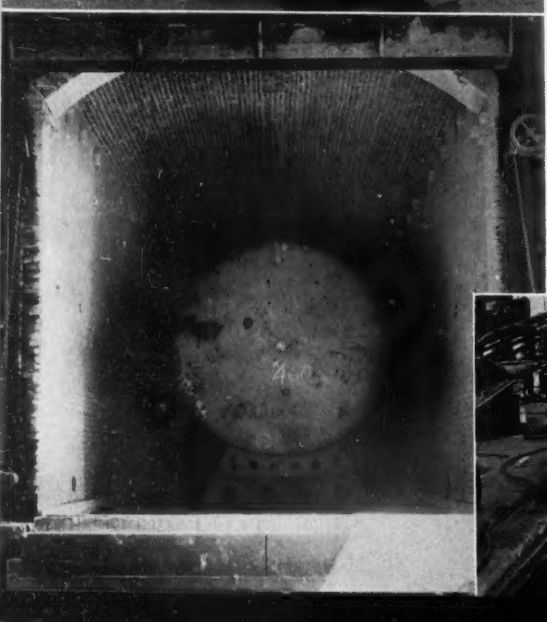

In constructing the new tanks three pieces of flat Lukens nickel-clad steel are rolled into circular segments and the seams automatically welded by the Linde Air Products' "Union-Melt" process on the outside. The inside of these butt joints are then welded manually with pure nickel electrodes. All welds are X-rayed (1) to meet specifications of the I.C.C. The flanged and dished heads are pressed out and then welded to the tank. Picture 2 shows the machining of male die member for pressing the main heads. The various members of the dome are made and then welded together on the outside with steel welding rods and on the inside (3) with welds of pure nickel. After anchor and other attachments are welded on, the tank is placed in an annealing furnace (4) to relieve any internal stresses caused by welding. Picture 5 shows the welding of outside heating coil assembly which is used to facilitate heating and unloading of the lading under certain conditions. After the tank is taken from the annealing furnace and cooled the heating coils are placed in position (6) and clamped to the bottom of the tank. It is supplied with six inches of fiber glass insulation (7) and with a steel shell. The tank is then mounted on an underframe where it is cradled by specially fashioned wooden supports and the anchor riveted to the car frame in the center. This assembly is then mounted on the trucks and completed with paint and attachments as shown in the picture at the top of the page.

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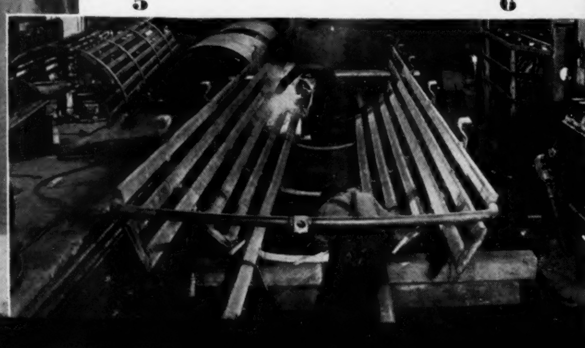

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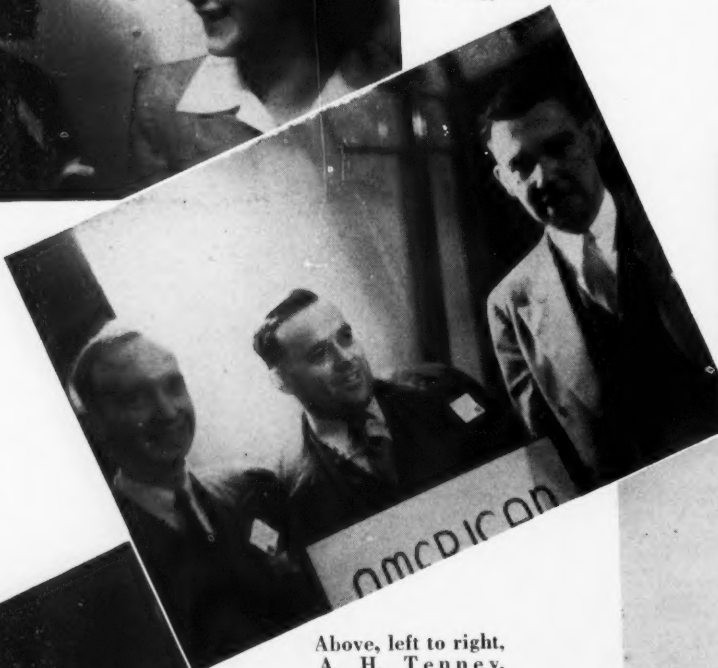
American Chemical Society Moonlight Cruise

ADVERTISING PAGES REMOVED

A goodly crew of members and guests of the New York, North Jersey and Western Connecticut sections of the ACS took a moonlight cruise June 6, on the Steamer Sandy Hook. Dancing, fresh air, refreshments and moonlight were provided as advertised and the photo at the left was taken from the boat to prove that there was moonlight. Below are some photos taken aboard ship.

Above, E. J. Durham, Professor of Chemistry, N. Y. U., Chairman Social Committee, N. Y. Section, and Dr. Joseph D. Clark, new research director of Glyco Products, Inc. Right, Dr. Robert Calvert, patent attorney, Chairman N. Y. Section, until July 1.

Left, Dr. John F. Petras, U. S. Rubber General Labs, Passaic, and Miss Mildred Kaye, N. Y. City, biology instructor.



Above, Dr. C. W. Rippie, Solvay Sales. Below, Dr. Foster Dee Snell, President of the consulting firm Foster D. Snell, Inc., and his wife, Dr. Cornelia T. Snell.

Above, left to right, A. H. Tenney, Columbia University, William F. O'Connor, Manhattan College, and P. W. Schutz, Columbia.

Left, Dr. Philip Bowman, Heyden Chemical Corp.

NEWS OF THE MONTH

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To Study Thiokol Production Methods

British rubber expert, William H. Stevens, Monsanto Chemical Co., London, arrived here by clipper late in June to study American methods of producing Thiokol self-sealing gasoline tanks and oil-proof airplane parts. After several weeks at the Thiokol Corp. plant, Stevens will tour American rubber plants to observe fabricating methods and return to England late in August. *(Photo taken at terminal.)*

IN REVIEW

MANUFACTURERS GIVEN EQUIPMENT PRIORITIES

Chemical Manufacturing Industry Is Given Priority Status for Repair and Maintenance Materials and Equipment—OPACS Issues Order Regarded as Necessary to Keep Up Production—OPM to Enforce the Program—26 Categories Are Included

UNINTERRUPTED operations in the chemical manufacturing industry were nearer complete assurance early this month when the industry was given priority status for repair and maintenance materials and equipment by virtue of an order issued by the Civilian Supply Allocation Division of the Office of Price Administration and Civilian Supply. The action was regarded as necessary to keep chemical manufacturing equipment in condition to fill expanded industry and defense program requirements.

26 Categories Covered

Covered by the order are 26 categories of the industry including petroleum producing and refining oil and gas pipelines, mining and quarrying, coke converting, metallurgical plants, industrial and academic research, hospitals, clinics and sanitariums, and transportation.

All divisions of the chemical manufacturing industry, including pharmaceutical chemicals, are understood to be included. There is no specific priority for the drug industry.

OPM to Enforce

The program, which will be enforced and administered by the Office of Production Management, provides that materials and equipment necessary for maintenance and repair of facilities in the industry shall be allocated to such use prior to other competing civilian demands. Allocations under the program will be watched to avoid accumulation of excessive inventories or diversion of parts still serviceable.

GOVERNMENT

A twenty-five per cent. expansion of capacity for production of finished 100 octane aviation gasoline has been recommended by Dr. Robert E. Wilson, Consultant, Petroleum Unit, OPM, and the Joint Aeronautical Board of the Army and Navy.

While the Army and Navy are not now in a position to place firm orders for the output of the expanded capacity, they have agreed to recommend that any new 100 octane plants, at least up to the total capacity specified, be given the benefit of accelerated amortization for tax purposes.

Dr. Wilson requested that the Petroleum Unit be advised promptly of any new plants to be installed in accordance with this request.

No expansion in facilities for the production of 91 octane or lower octane gasoline is deemed necessary at this time.

COMPANIES

Celebrates 110th Year

Philadelphia Quartz Co. on July 20 celebrates its 110th anniversary. The business which was originally a soap and candle business founded by Joseph Elkinton is now under the direction of the third generation of the family of the founder. The company has a fascinating history.

Early in 1858 equipment was bought for experimenting with silicate of soda. In the '60's, the war between the states caused curtailment in rosin supplies from the South. Other soap materials also soared in price. Soluble glass was mixed with the soap as a substitute for the rosin and was found successful.

Research of the company over a long period has developed a series of chemicals made by varying the proportions of the ingredients of silicate of soda. Now from the one solution originally produced the company's catalog includes over 33 different silicates.

The present name, Philadelphia Quartz Company, was used in 1864 when a partnership was formed to manufacture the new chemical silicate of soda. Soap manufacture was discontinued in 1904 when the Philadelphia Quartz Company was incorporated.

About the time of the celebration of the company's beginning of another century in business came the announcement of two new alkalis, previously not commercially obtainable. These chemicals, sodium metasilicate and sodium sesquisilicate made available to industries alkaline cleaners which had active alkali qualities but which were controlled by silica content. Thomas W. Elkinton is now president of the company.

Niagara, EBG Combine

Niagara Alkali Co. and Electric Bleaching Gas Co. joined forces July 1st to operate as one organization under the name of Niagara Alkali Co. This move, which involves no change in personnel or policies, has been made to facilitate the operations of the two companies and increase efficiency of service.

Joining of their resources, it is said, is the logical result of their closely-knit producing, selling and distributing operations, which in recent years have become more and more a matter of joint rather than separate responsibility. Niagara Alkali manufactures caustic soda, caustic potash, carbonate of potash and paradichlorobenzene at its plant in Niagara Falls, N. Y. Electro Bleaching, at its adjacent plant, produces by the electrolytic method, EBG liquid chlorine.

EBG was the first American company to produce liquid chlorine, and was formed in 1907 for that purpose, with E. D. Kingsley as its founder. Later, EBG introduced the use of liquid chlorine as a bleaching agent to the pulp and paper industry and the shellac industry. One of the company's outstanding achievements was the adaptation of liquid chlorine to the purification of water supplies and the sterilization of sewage.

Niagara Alkali was the first to produce caustic potash in America. Recently, Niagara pioneered again and became the first American producer of carbonate of potash, used chiefly in the glass industry for the manufacture of fine glassware. It is expected by the management that the union of the two firms into one closely integrated organization will increase and

Above, Niagara Alkali's modern plant at Niagara Falls.

simplify the value of the service given to users of their products throughout industry.

Hercules Buys Lewis Synthetic Resin Business

Hercules Powder Co. purchased this month the synthetic resin business of John D. Lewis, Inc., Providence, R. I. With this acquisition, Hercules, largest producer of rosin in the United States, and also a manufacturer of synthetic resins, becomes a major unit in the production of synthetic resins.

On July 1, Hercules acquired the land, buildings, equipment, and processes of the Lewis synthetic resin plant at Mansfield, Mass., and the entire plant at Brunswick, Ga. Lewis products, which Hercules will continue to manufacture, include Imperial ester gum, Lewisol maleic-modified ester gums, Lewisol phenolic-modified ester gums, and various phenolic and alkyd resins. John D. Lewis, Inc., will continue in the production of textile and heavy chemicals at Mansfield, Mass.

Lewis company's sales and manufacturing facilities will be joined with the synthetics department of Hercules, which has been producing synthetic resins since 1936 under the direction of W. M. Billing.

John B. Lewis, president and treasurer of John D. Lewis, Inc., will act as consultant for Hercules during the time required for consolidation, making his headquarters at Providence, R. I. Howard Bates, vice president of the Lewis company, will join the sales staff of the Hercules Synthetics Department, with headquarters temporarily at the Mansfield plant.

The Mansfield plant will be operated under the direction of R. F. Schlaanstine, director of operations of the Synthetics Department. Dr. R. Marx, technical director of the Mansfield plant, will continue in this capacity. The Lewis plant at Brunswick, Georgia, will be operated by the Hercules Naval Stores Department for the Synthetics Department.

New Consulting Firm

A new firm of technical consultants, Crowley & Bennett, was formed recently with Chicago headquarters at 6803 N. Clark st. and the Eastern branch at 228 King st., Brooklyn, N. Y.

Chicago laboratories are especially equipped for electro-chemical, lubrication, metallographic and other highly specialized problems.

Quaker Issues Bonus

In accordance with its policy of sharing profits with all employees, Quaker Chemical Products Corp., Conshohocken, Pa., made cash payments to employees on July 1. These payments varied from one week's to six weeks' pay based upon the individual employee's term of service with the company. This payment was in addition to the profit sharing distribution made at the end of 1940.

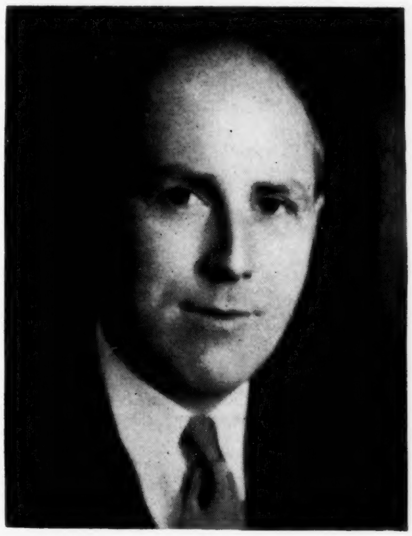
Above, Leo Roon, founder and president of Roxalin Flexible Lacquer Co., Elizabeth, N. J., newly-elected president of New York Paint, Varnish and Lacquer Manufacturers' Association.

Rumford Works Cited

Rumford Chemical Works has been awarded the citation annually bestowed by the Engineering Societies of New England in recognition of the company's success in developing a product which opens "new and desirable applications and so extends the possibilities of employment." The award was granted in recognition of Rumford's development of sodium tetraphosphate, marketed under the trade name of "Quadrafos".

Heekin Anniversary

Heekin Can Co., Cincinnati, O., will observe its 40th anniversary Aug. 2. Founder Albert E. Heekin is still president of the company. In addition to its manufacturing plant, the company also owns a lacquer and varnish company, a box manufacturing company and the Heekin River-Rail terminal.



Above, Dr. Theodore M. Switz who has been appointed director of the Export Department of Hercules Powder Co., succeeding P. W. Meyeringh who is now vice-president and member of the executive committee.

Nelson Buys Autovent

Herman Nelson Corp., Moline, Ill., recently purchased the entire assets and business of the Autovent Fan Blower Co., Chicago.

Interesting Articles

A new, finely-divided, technically-pure precipitated calcium carbonate, "Witcarb." is discussed in the latest issue of "Witcombings," house magazine of Wishnick-Tumpeer, Inc., New York. Copies are available upon request.

An article on ammonia from the standpoint of interest to the general reader appears in the July number of *Priorities* house magazine of Prior Chemical Corporation, New York.

In New Locations

Headquarters of the New York Chemical Warfare Procurement District have moved from 45 Broadway, to 292 Madison avenue. Major Harry A. Kuhn, Chemical Warfare Service, is in charge of this district which includes New York, New Jersey, eastern Pennsylvania, Delaware and Maryland.

Gering Products, Inc., buyer and seller of plastic scrap materials has moved to North 7th st. and Monroe ave., Kenilworth, N. J., telephones CRanford 6-2144 and 6-2145.

Greene, Tweed & Co., manufacturers of Palmetto and other brands of packings and special tools, have moved their manufacturing plants and general offices to the Palmetto Bldg., Bronx Boulevard and 238th st., N. Y. City.

Griscom-Russell Co., manufacturer of heat transfer apparatus, announces the new location of its Houston office at 1548 Esperson Building, Tex.

The company has also recently moved the Tulsa Office to a new location at 810 Petroleum Building.

ASSOCIATIONS

Junior Chemical Engineers of New Yok City, an organization founded in 1937 for young chemists and chemical engineers recently elected the following members as officers for 1941-42:

President: Francis B. White, Foster Wheeler Corp.; Vice-President: Howard Ten Broeck, Socony Vacuum Oil Co.; Secretary-Treasurer: J. R. Callahan, *Chem. & Met. Eng.*; Asst. Secretary-Treasurer: Herbert Quina, Amer. Agric. Chemical Co.

Plan Fall Meeting

More than 25 members of the Drug, Chemical and Allied Trades Section of the New York Board of Trade met June 12 to draw up the program for the Section's 6th Annual Fall Meeting and Golf Tournament which will be held on October 23-26, at Skytop, Pa.

Above, Charles B. Durgin, now assistant director of research, Monsanto Chemical Co., Anniston, Ala., (Phosphate division).

Southern Chemurgists Meet

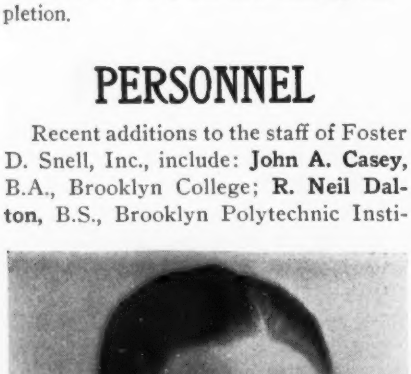
First annual Southern Chemurgic Conference was held late in June at Nashville, Tenn., to discuss the planting and growth of new crops in the South. Markets available for production were described by speakers covering such products as soybeans, tung nuts, sage, poppy, coriander and others.

Welding Convention

American Welding Society Annual Meeting and Convention, will be held in conjunction with the National Metal Exposition, Philadelphia, Pennsylvania, October 19th to 24th, are now nearing completion.

PERSONNEL

Recent additions to the staff of Foster D. Snell, Inc., include: **John A. Casey,** B.A., Brooklyn College; **R. Neil Dalton,** B.S., Brooklyn Polytechnic Institute; **John Mandel,** graduate of the University of Brussels (Belgium). **William A. Rassiga,** B.S., College of the City of New York; M.A., Columbia University.



Above, G. C. Stephenson who has just been appointed sales manager for the Tar and Chemical Division of Koppers Co., Pittsburgh.

Bertrand A. Landry has joined the staff of Battelle Memorial Institute, Columbus, O., where he is engaged in research and developmental work in the division of fuels research.

Robert E. Scher, Scher Brothers, N. Y. City, won the annual golf tournament of the New York Section of the American Association of Textile Chemists and Colorists last month at North Jersey Country Club with a net 69.

Gustave Bayer, New York office manager of Merck & Co., retired from business July after serving with Merck for 46 years. He was made office manager in 1926 . . . **Charles Pinnell,** Merrimack Manufacturing Co., has been re-elected president of the Textile Color Card Association of the U. S., Inc.

Joseph J. Morsman, assistant manager, Chicago branch, National Lead Co., retired July 1 from active duties with the company. He retains his post on the company's directorate . . . **Frank Revell** has joined the staff of sales engineers of the Foxboro Co., Foxboro, Mass. . . . **Erwin L. Gehrke,** also has been added to the staff.

Earl P. Stevenson, president of Arthur D. Little, Inc., Cambridge, Mass., received the honorary degree of Master of Arts at the Commencement Exercises of Wesleyan University, June 15. He is an alumnus of the University.

Samuel Reid has been added to the staff of Cochrane Steam Speciality Co., Boston, for sales engineering work. . . . **Forrest G. Sharpe,** formerly assistant to the sales manager, Pangborn Corp., Hagerstown, Md., has been appointed Philadelphia sales manager of the company... **R. M. Cleveland** has been appointed manager of the Boston office of Worthington Pump & Machinery Corp. He succeeds **W. A. Finn** who has been called to active duty as a lieutenant in the Navy.

G. Dewey Spies has been added to the technical sales force in the Northern Ohio territory for Quaker Chemical Products Corp., Conshohocken, Pa. ... **W. M. Paquin** has been added to the technical sales force in the Wisconsin territory.

Seymour W. Ferris, chief chemist of the Atlantic Refining Co., has been appointed chairman of a general committee to direct arrangements for the 102nd meeting of the American Chemical Society, which, sponsored by the Society's Philadelphia Section, will be held at Atlantic City, N. J., Sept. 8 to 12.

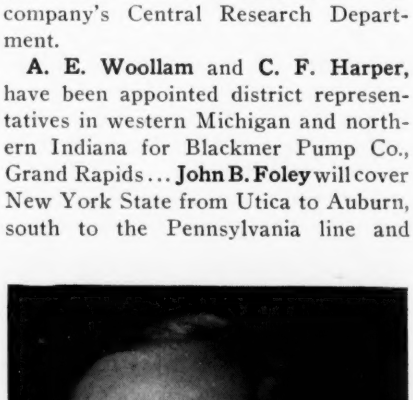
Above, James F. Hand, newly-appointed assistant general manager of sales, Monsanto Chemical Co., rubber service department, Akron, O.

Donald S. Collard, Superintendent for a number of years in charge of manufacturing at the Warwick Chemical Company, West Warwick, Rhode Island, has been transferred to their Rock Hill, South Carolina plant with the title of resident manager.

E. S. Bissell has been made vice-president of the Mixing Equipment Co., Inc., Rochester. Prior to his promotion, Mr. Bissell was technical sales manager.

Dr. Campbell Rogers McCullough from the research staff of the Phosphate Division of Monsanto to the company's Central Research Department.

A. E. Woollam and **C. F. Harper,** have been appointed district representatives in western Michigan and northern Indiana for Blackmer Pump Co., Grand Rapids... **John B. Foley** will cover New York State from Utica to Auburn, south to the Pennsylvania line and



Above, Dr. J. Enrique Zanetti, director of chemical laboratories, Columbia University, who has been called to active duty as Colonel in the Chemical Warfare Service.

north to St. Lawrence . . . **W. A. Duncan** has been transferred from the factory to the southeastern division headquarters, in Atlanta, Ga. . . . **Henry G. Carter,** will cover Florida . . . **Paul Brenner** has recently been appointed to take care of the Blackmer interests in the Youngstown, O., area . . . **J. H. Spenger** has recently been appointed to take care of the western Tennessee and eastern Arkansas territory.

Harry B. Lose has been appointed superintendent of construction for Koppers Co., Engineering and Construction division.

Bolton to Get Medal

The Society of Chemical Industry has elected Dr. E. K. Bolton to receive the Chemical Industry Medal for 1941, the medal awarded annually to a person making a valuable application of chemical research to industry. Presentation will be made at one of the first two of the Fall meetings.

Since 1930 Dr. Bolton has been Chemical Director of the du Pont Company. He was intimately associated with the research leading to the development of neoprene and nylon and was in fact instrumental in initiating the research in the du Pont Company on synthetic rubber.

Spalding Gets Medal

George R. Spalding of Oradell, N. J., sanitary engineer of the Hackensack Water Company, received a George W. Fuller Memorial Award of the American Water Works Association for meritorious achievement in improving water works service, at a dinner in Toronto, Ontario, June 26, closing event of the association's annual four-day convention.

OBITUARIES

Harry C. Merriam

Harry C. Merriam, a graduate of the Massachusetts Institute of Technology in the class of 1906, and a member of the board of directors of E. B. Badger & Sons Co., died suddenly in Newton, Mass., June 27, at the age of 56. Mr. Merriam became associated with Badger late in 1917 as a member of its chemical engineering sales division.

Warren G. Jones

Warren Gilman Jones, president of the W. A. Jones Foundry & Machine Co., Chicago, succumbed to a heart attack and died June 6 at his home in River Forest, Ill.

Stanley Warzala

Stanley Warzala supervisor of safety at the Calco Chemical Division of American Cyanamid Co., died after a short illness, June 9, at the Somerset Hospital. He was 63.

Guy Barker

Guy A. Barker, manager of the public utility and electrical products departments of Johns-Manville, died June 18 soon after he suffered a heart attack at his home in Scarsdale, N. Y. He was 50 years old.

Edward J. Smail, Jr.

Edward J. Smail, Jr., 53, general sales manager of the Rubber Service Department of Monsanto Chemical Co., died June 8 at People's Hospital, Akron, O., after a lengthy illness.

CONSTRUCTION

Government Buildings

Government's TNT plant under construction near Sandusky, O., will be expanded to the tune of $20,000,000 bringing the total cost of the project to $32,763,330, recent information shows. Plant is to be operated by Trojan Powder Co., Allentown, Pa. It will manufacture both TNT and DNT.

A $30,000,000 Des Moines munitions plant authorized by the government and operated by the U. S. Rubber Co. is under construction. This will be U. S. Rubber's first attempt at manufacture of munitions, a move occasioned by a suggestion that it use personnel and administrative knowledge in the manufacture of small arms ammunition.

Universal Powder Co. is constructing a powder plant at Tenino, Wash., for the manufacture of black powder for the government.

Copperhill, Tenn., will be the site of a $2,375,000 oleum plant to be constructed shortly, according to a recent War Department announcement. Plant will be government-owned.

Other Construction

Initial Pacific Coast production of high melting-point, fully refined petroleum waxes began July 1, according to a recent announcement by Union Oil Co. Bearing the "Aristo" trade name, the waxes will be marketed by Petroleum Specialties, Inc., N. Y. City.

Construction is under way on a new two story brick and steel office building to be erected as an addition to the Elizabeth, N. J., plant of Borne Scrymser Co. Upon completion of this new unit, which is anticipated by early fall, the executives, clerical force, and the sales department will be moved from their present New York City location to the new building.

Philadelphia Quartz Co. of California has begun construction of a new chemical plant in Tacoma, Wash., to manufacture sodium silicate. Plant, which will cost

$250,000, will supply liquid mineral adhesives to the plywood industry.

Durez Plastics & Chemicals Inc., North Tonowanda, N. Y., has begun a $400,000 expansion program to increase its production of phenol plastics about 40 per cent. New equipment and additional buildings will be added.

Arnold, Hoffman & Co., manufacturing chemists, Providence, recently took over the dextrine plant of Corn Products Refining Co., Edgewater, N. J. Equipment has been moved to Dighton, Mass., where the company has set up a modern dextrine manufacturing plant.

St. Louis Chemical & Mfg. Co. has purchased the property it has occupied for the last two years, and has expanded the plant. Additional equipment has been added. Company manufactures vegetable adhesives, sizing starches, dextrines and various chemical compounds.

Stauffer Chemical Co. recently purchased a large site in North Portalon Harbor, Ore., for construction of a plant to produce aluminum sulfate (papermaker's alum). Cost of the first unit will be $100,000.

Masonite Corp., Laurel, Miss., is spending more than $1,500,000 for expansion and improvements in its plant to speed up wood fibre-board production.

Carbide & Carbon Chemicals Corp. plant in Texas City, Tex., will be enlarged extensively, it was revealed recently. Details are not yet available.

American Can Company announces plans for the construction of additional plant facilities in the St. Paul-Minneapolis area to be built at a cost of several million dollars.

Continental Can Co., Inc., will construct a packers' can plant at Mankato, Minn., to be completed before the end of 1941.

Plans for a new anhydrous ammonia plant costing $16,750,000 at Louisiana, Mo., were revealed by the War Department last month.

Heyden Chemical Corp. is planning to spend about $800,000 for additional buildings, machinery and equipment at its plants at Ford and Garfield, N. J.

An $8,000,000 plant for the manufacture of picric acid, the Maumelle Ordnance Works, is being constructed by the government at Marche, Ark.

Empire Chemical Co., Newark, N. J., will buy the Jersey Ave. plant of Standard Oil for the manufacture of pharmaceuticals.

Rademaker Chemical Corp., East Lake, Mich., is planning a new plant for the manufacture of dead-burned magnesium oxide. Total cost of the program is expected to be about $500,000.

Strikes Diminish

A study of War Department charts of labor disputes disclosed this month that strikes in factories working on Army contracts and among workmen on War Department and defense industry construction projects resulted in a loss of 2,458,150 man-days during the first six months of 1941.

Army contracts were delayed by a total of 187 strikes, involving 213,900 workers. Each strike lasted an average of eleven days and involved 1,144 men.

Officials were encouraged by the steady decline in strikes which began in mid-June but the department's records showed little difference in the rate and magnitude of strikes during the first quarter as compared with the second.

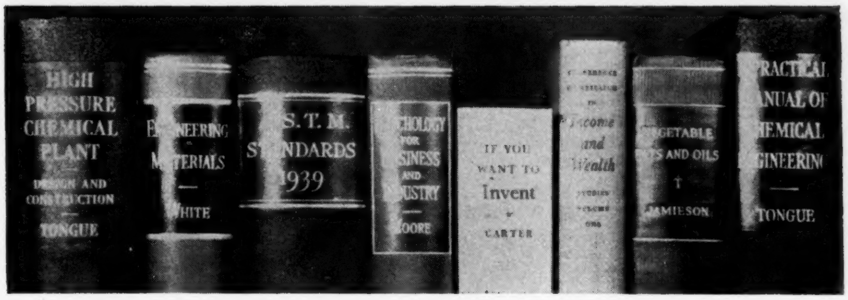
Shipping and Container Forum
By R. W. Lahey

(Continued from page 66)

volume warrants there is available a nesting machine manufactured by Standard-Knapp which automatically fills the paper shipping container.

The shipping containers are then closed by folding the top and gluing, folding and taping, or sewing. These bags are of multi-wall construction, can be made as strong as required, and are approved by the Freight Classification.

If desired, these small bags may also be packed in fiber or wooden boxes, drums or other adequate shipping containers.



The Industry's Bookshelf

The Chemistry of Powder and Explosives, by Tenney L. Davis, John Wiley & Sons, Inc., New York, N. Y., 216 pages, $2.75. With the present emphasis on production of military supplies, a great many chemists and engineers are running into problems concerning the production and handling of explosives. Because of this and the fact that a great many young chemists not previously experienced with explosives will soon be working with them, the author has published part of the material which was originally being prepared for publication at a later date.

The original plan of the book called for nine chapters as follows: Properties of Explosives, Black Powder, Pyrotechnics, Nitric Esters, Smokeless Powder, Dynamite and Other High Explosives, Ammonium Nitrate and Nitroamines, Primary Explosives, Detonators, and Primers, and Aromatic Nitro Compounds. Of these, four chapters have been published. They are: Properties of Explosives, Black Powder, Pyrotechnics and Aromatic Nitro Compounds.

The present book is elementary in the sense that it contains nothing which is not the common knowledge of those who are either skilled in chemistry or in the manufacture and use of explosives. Yet the author intends to supply an adequate basis upon which an uninitiated chemist commencing work in an explosives laboratory or in the explosives industry may build up a further and more specialized knowledge.

At first glance it might seem that the chapter on Pyrotechnics contains too much matter that is extraneous and not worthy of inclusion, namely the extensive ancient descriptions and formulas and material on the construction of firework pieces. However on second thought, although its inclusion is not essential, the material affords interesting background and a broader knowledge of the subject as a whole. The chapter on aromatic nitro compounds seems particularly good. It deals with the physical and chemical properties and the principles underlying the use of these materials.

As a whole, the book seems to have accomplished its aim of presenting the characteristics and behavior of explosive substances quite well.

Nazi Europe and World Trade, by Cleona Lewis, The Brookings Institution, Washington, D. C., 200 pages, $2.00. If Germany wins the present war what will be the position of a German-dominated continent of Europe in future world trade? In an attempt to shed some light on this question the author has assumed in this book, not as a prediction but merely for the purpose of a trade analysis, that Germany, at the end of the war, will control all of continental Europe west of Russia and the states in the Russian sphere of influence.

The countries included in such a German controlled Europe would be as follows: Albania, Austria, Belgium-Luxemburg, Bulgaria, Czechoslovakia, Denmark, France, Germany, Greece, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, Rumania, Spain, Sweden, Switzerland and Yugoslavia.

In general the question considered in the analysis is whether, judged by past performances, the resources of the area covered by these countries are of such character that independence of foreign sources of supply is likely to be realized; or if self-sufficiency is lacking, whether the area enjoys extrordinary advantages in the field of trade. Specifically the questions considered are: (1) Is the area independent with respect to foodstuffs? (2) Is the area self-sufficient as to agricultural raw materials and forestry products? (3) Does the area produce all the industrial minerals normally required? (4) What are the primary foreign sources of supply from which import requirements are met? (5) What exportable surpluses are available, and what are the principal outlets for European exports? (6) What other sources of income are available for meeting income requirements?

The analysis of these questions is based on two reasonably favorable years, 1937, and 1929. It weighs the area's productive resources against its requirements and thus attempts to gauge some of the important elements of strength and weakness, in future economic setups. The inherent advantages and disadvantages thus revealed promise to play an important part in determining the future trade of the area.

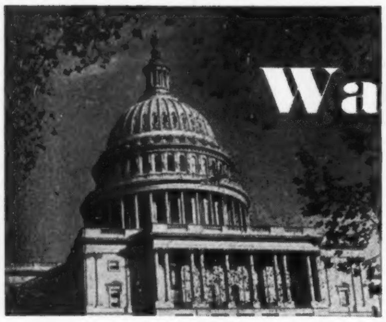
Whatever the outcome of the war, this trade analysis should prove a valuable reference source for those interested in problems of world trade.

The Theory of Rate Processes, by Samuel Glasstone, Keith J. Laidler, and Henry Eyring, McGraw-Hill Book Company, Inc., New York, 611 pages, $6.00. The calculation of rates of chemical reactions, using only such fundamental properties such as the configurations, dimensions, interatomic forces, etc., of the reacting molecules has long been one of the unsolved problems of physical chemistry. Although the solution of the problem has not been completely accomplished, the last ten years has seen a great deal of progress by the use of quantum mechanics and statistical mechanics. The use of these two methods has resulted in the development of what is known as the "theory of absolute reaction rates."

Book Shows Progress

One of the objects of this book is to show the progress that has been made. Most of the subject matter has been hitherto available only in the form of papers in various scientific journals, which of necessity have been very short and concise and consequently may have seemed more difficult to those not familiar with the subject than would be the case if the material had been expanded and surrounded with related material. Recognizing this, the authors have taken the opportunity, with the additional space available, to develop the theoretical bases and to give the practical applications in somewhat greater detail.

The fundamental bases are explained, and homogeneous and heterogeneous gas reactions, reaction in solution, viscosity, diffusion, and electrochemical phenomena are considered in terms of the theory.



Washington

By

MACK H. WILLIAMS

THE overhauling of the Office of Production Management snipped away sizeable quantities of red tape. OPM in its new form will look amazingly like the old War Industries Board of Bernard Baruch's era, and will make sense to business men accustomed to dealing with a question in its entirety.

In place of the separated units in OPM's three branches—production, priorities and purchases—a single section will be set up for each commodity. Represented on it, in addition to the three branches, will be the Army and Navy, the Labor Division, the Office of Price Administration and Civilian Supply.

Mack Williams

A problem concerning the commodity, whether it involves priorities, production or purchasing, will be handled within the section and the section chief will administer the decision. In the past, dividing of a commodity into three OPM branches and OPACS produced irritating delays and impediments to defense arming.

The OPM division directors—John D. Biggers in production, Donald M. Nelson in purchasing, and E. R. Stettinius in priorities, remain. Each will supervise those commodity sections where the predominant problem involves his type of work.

Thus, the chemical commodity section, where production and expansion of facilities is the topmost problem, will come under Mr. Biggers' supervision. The zinc and copper sections, which will be largely concerned with rationing and priorities, will be under Mr. Stettinius. And Mr. Nelson will supervise the drug and food commodity sections, since these will be concerned mainly with purchasing.

The commodity sections represent the government side of the fence. Business men are on the other side in the shape of industrial advisory committees. Each section will have a corresponding advisory committee, with members nominated by the industry and selected by OPM.

Although apparently shunted off, the groups will be in extremely important positions. Bolstered by the willingness of the Justice Department to compromise on anti-trust enforcement, they will be able to consider the once forbidden questions of allocation of orders and curtailment of some kinds of production.

These recommendations, when necessary for defense, will be made to the commodity section chief and if approved by him and his superiors, will be ordered.

The Justice Department has declared that so long as the actual ordering of these restrictions is done by the OPM, the anti-trust laws will not be violated while the policy is in effect.

OPACS Still With Us

Under the reorganization, OPACS with its powers to fix ceiling prices and allocate among competing civilian industries the residual production of an industry that supplies the military forces, is adjacent to OPM and in close cooperation. The reorganization does not affect or change OPACS, which will continue its chemical and other commodity sections.

Interpreted as an outcome of the tussle between New Dealers and business men in the defense agency, the reorganization is a victory for the New Dealers. They have succeeded in isolating the business influence in the advisory committees. And a new OPM rule prohibits paid trade association executives from serving.

Viewed from the standpoint of the practicing business man who must comply with OPM regulations to do his daily job, the reorganization is an important step forward.

The stabilization of the OPM has not been equalled within the OPACS. An upsurge in prices, Congressional hostility to the price ceilings of Administrator Leon Henderson, and the pointblank challenge of his authority by the Chrysler Corporation provide three prime worries for the agency.

Henderson is relying on President Roosevelt to combat the threats to his authority. Congressmen angered by Henderson's action in fixing a ceiling on cotton seed oil and moving in the direction of other farm products, have been told that OPACS is an arm of the executive office. The White House has long had under consideration formal legislation to freeze all prices at a specified level, probably that of the period immediately prior to the defense program.

Such a bill could be easily pushed through by the strong Administration majority in Congress. It would force Chrysler to back down in refusing to rescind price increases as requested by Henderson. Violations of the price ceiling would then be a breach of an act of Congress, a more serious event than refusal to obey an agency whose powers stem from an executive order.

Henderson is far from cautious by nature, but he has refrained from using his two foremost weapons against Chrysler. These are the ability to commandeer plants needed for defense and deny offending companies transportation through rail and waterway priorities.

Either would affect a large number of workers, causing unemployment and intensifying the dislocation in the auto industry caused by the defense effort.

His only other weapon that is not cloaked with doubt is publicity, and Henderson is invoking it to the fullest against Chrysler. Angry statements and presentation of the "full facts" to Congress and the public followed the company's challenge.

That the recent wave of wage increases was in some measure responsible for the uptrend in prices is more or less apparent. Henderson now doubts that industry can pay more to labor without seeking compensation in higher prices. Pay boosts that were won by strikes up to now, he feels, were easily absorbed by industry through the lowered unit cost of production caused by defense orders.

Thus, Henderson's tacit approval may not accompany the union leaders when they agitate for new raises. Another such wave might pressure the price structure sky-high, and Henderson is said to be fully aware of the dangers.

Washington Briefs

Chemical producers are assured of supplies and materials needed for repair and maintenance of their plants. OPACS has included the industry in an allocation program covering such items and giving companies a priority status in bidding for them.

Other industries considered "essential to public welfare and civilian supply" are covered by the allocation, including metallurgical plants engaged in production of raw materials, industrial and academic research, and mining and quarrying.

The tax bill completed by the House ways and means committee and sent to the floor of the House is as political as a $3.5 billion dollar measure could possibly be.

The income tax base is not broadened, although surtaxes are. Corporations are hit harder than the Treasury suggested,

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Right, J. W. McLaughlin, Carbide, and M.C.A. Treasurer.

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Above, Dr. Elvin H. Killheffer, Du Pont; "Senor Francisco Juarez" who as a supposed good will "ambassador" from South America provided many good laughs at the dinner meeting; Dr. August Merz, Calco Division of Cyanamid, and S.O.C.M.A. President; Lammot du Pont, M.C.A. President; and H. L. Derby, president American Cyanamid.

Above, H. W. Kochs, and August Kochs, President of Victor Chemical Works; left, James J. Kerrigan, Vice-President, Merck & Co., and George Merck, President, Merck & Co., and also an M.C.A. Vice-President.

Dr. Frederick W. Russe, Vice-President, Mallinckrodt Chemical Works.

Howard R. Huston, Assistant to the President, American Cyanamid, and George W. Snibbe, Davison Chemical.

H. A. Gomans, President, Natural Products Refining Co.

Left, Major T. P. Walker, President, Commercial Solvents, and Glenn L. Haskell, Vice-President.

Right, Henry Howard, well-known and beloved by the chemical industry, was warmly welcomed to the meeting.

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& Co.

Left, Albert A. Teeter, Treasurer, Chas. Pfizer & Co., and well-known photographer, pauses between pictures to have his own taken.

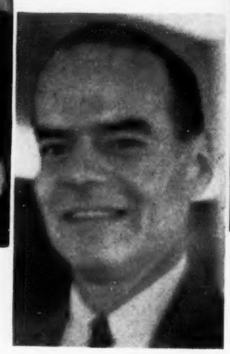
Right, Milton Kutz, popular executive of the R. & H. Chemicals Division.

"THE AMERICAN CHEMICAL INDUSTRY

Manufacturing Chemists' Association 69th

Left, Ben P. Steele, manager of sales, Penn. Salt Mfg. Co., below him, E. M. Allen, President, Mathieson Alkali Works; R. S. Mueller, Davison Chemical Corp., Baltimore, Md.; and A. L. Walker, Jr., Texas Gulf Sulphur Co.

Chemical executives from all over the country gathered at Skytop last month to discuss various phases of national defense. In addition to the discussions which covered raw materials, intermediates, production problems, transportation and priorities, the program included bowling on the green, golf, dinners, parties and other convention gayety in customary form. "A good time was had by all."



Above, J. Warren Kinsman, Du Pont, and Don Williams, Assistant General Sales Manager, Dow Chemical.

Above, Charles A. Mace, Secretary of the S. O. C. M. A. Right, Thomas W. Elkinton, President, Philadelphia Quartz Co.

J. L. Smith, Vice-President, Chas. Pfizer & Co.; Carl Anderson, Attorney for Merck & Co.; H. W. Johnstone, Vice-President and Factory Manager, Merck & Co.; and George A. Anderson, President, Chas. Pfizer & Co. (Directly below).

"—A BULWARK OF NATIONAL DEFENSE"
Annual Meeting June 4 and 5, Skytop, Pa.

All officers of the association were unanimously reelected. Lammot duPont, E. I. duPont de Nemours, president, opened the meeting and spoke of the progress in national chemical self-sufficiency since the first World War. H. L. Derby, president of American Cyanamid & Chemical and chairman of the executive committee, summarized the year's cumulative activities of the M. C. A.

At the right, Sidney Thayer, Jr., Vice-President, Henry Bower Chemical Mfg. Co., and to the left and below, Robert I. Wishnick, President, Wishnick-Tumpeer, Inc.

Above
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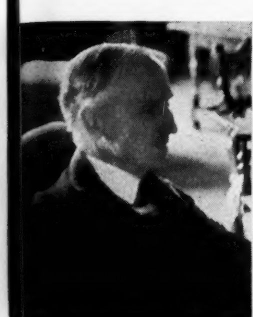
Sweze



Above, Fred. A. Eustis, Secretary and Treasurer, Virginia Smelting; George Cooper, Vice-President, Diamond Alkali; H. F. Atherton, President, Allied Chemical & Dye; and J. T. Richards, President, Diamond Alkali.

Above, John A. Chew, President, John A. Chew, Inc.

At the left, Fred. W
Fraley, Jr., Director o
Sales, Diamond Alkal

Right, R. M. Curts, American Potash & Chemical.

Bowling on the green proved to be one of the most popular of sports.

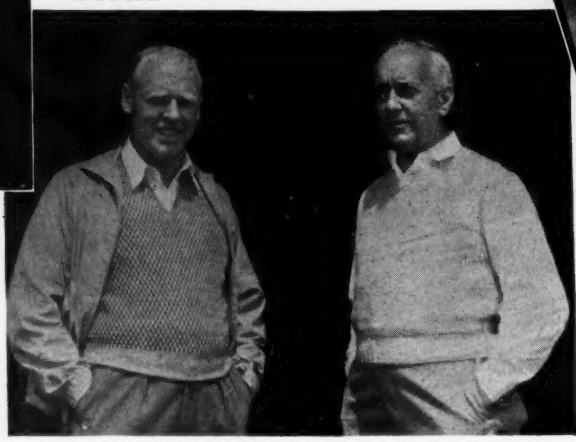
Below, Fred T. T
Agency Division, T
President, Henry B
A. Benington, Vice
America.

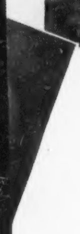
Above, left, John Stauffer, President, Stauffer Chemical, and Warren Watson, M.C.A. Executive Secretary. Center, W. F. Zimmerli, Joseph Swezey and Elvin H. Killheffer, all of Du Pont.

Bert Cremers and J. H. Remmick, both of Michigan Alkali.

Above, John A. Chew, President, John A. Chew, Inc.

Below, Ray H. Giebel, Vice-President, Harshaw Chemical Co. of N. Y., and William J. Harshaw, President, The Harshaw Chemical Co. To the right, Lincoln M. Shafer, President, Phoenix Color & Chemical; and Dr. A. D. Chambers, Du Pont.

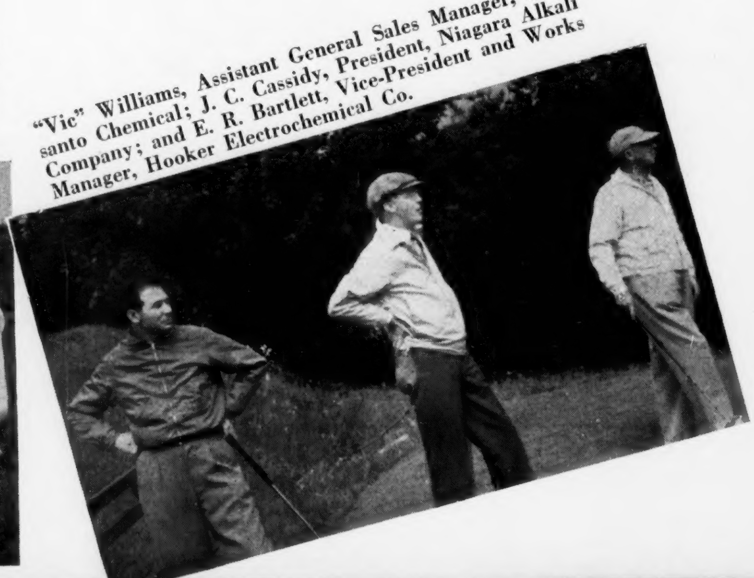




At the left, Fred. W. Fraley, Jr., Director of Sales, Diamond Alkali.

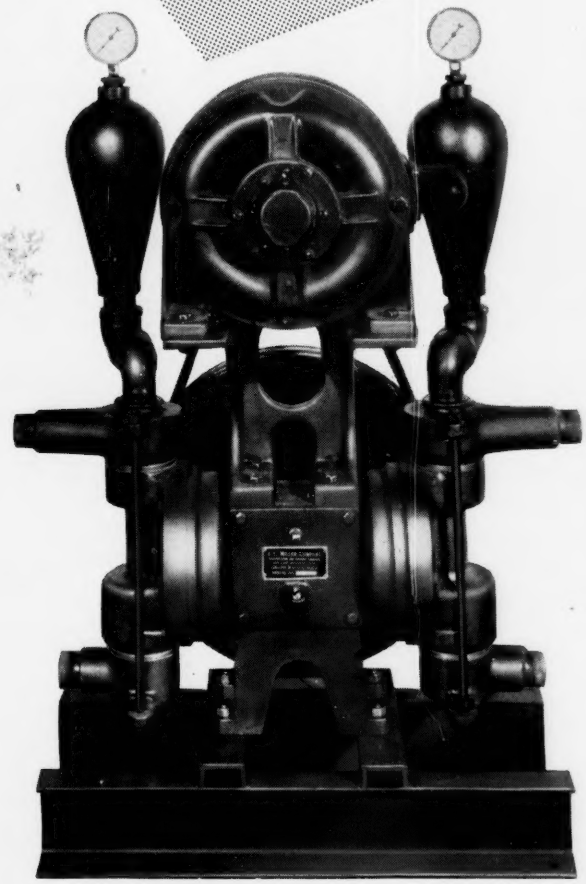
Below, Fred T. Techter, General Sales Manager, Sales Agency Division, The Barrett Co.; Henry Bower, Vice-President, Henry Bower Chemical Mfg. Co.; and George A. Benington, Vice-President, Mutual Chemical Co. of America.

"Vic" Williams, Assistant General Sales Manager, Monsanto Chemical; J. C. Cassidy, President, Niagara Alkali Company; and E. R. Bartlett, Vice-President and Works Manager, Hooker Electrochemical Co.



MILLER

Dual Pumps



THE Miller Dual Pump is of the diaphragm type. This means it is a positive displacement pump delivering a constant volume against the varying heads.

Our diaphragm pump is also more efficient per horsepower input than any other type of pump known. As compared to the average centrifugal pump working under average conditions, our pump requires about one-half and never more than two-thirds of the power in delivering the same volume.

THE INHERENT CHARACTERISTICS OF THE MILLER DUAL PUMP MAKES IT IDEAL FOR USE IN PUMPING AND PROPORTIONING TWO DIFFERENT FLUIDS SIMULTANEOUSLY. Furthermore, because the fluid pump does not come in contact with any moving parts of the pump except the oscillating rubber diaphragm, there is no wear on the pump mechanism even though the fluid contains abrasive solids in suspension. The hazard of contaminating pumped fluids with grease or oils from bearings or stuffing boxes is absolutely eliminated.

This unit is very easily disassembled in case replacement parts are required. It is only necessary to make inspection occasionally to see that the oil chamber is filled. Many of the Miller Dual Pumps have been in use for a period of 4 to 5 years without any repairs. The Miller Dual Pump is self-priming and capable of lifting as high as 18 to 20 feet of heavy sludge.

Miller Dual Pumps can be furnished with rubber linings or in cast iron or bronze models.

Rated capacity, 500 gallons per hour from each head. Also can be furnished as one unit at 1000 gallons per hour. It is very readily adapted to all applications.

Send us your inquiries and let us assist you in prescribing the correct pump for your requirements.

Delivery, 5 to 6 weeks.

J·C·Miller Company *Manufacturers of*
Electroplating
and Polishing
Equipment
and Supplies

528 Lake Michigan Drive N·W·
Grand Rapids · Michigan

and individuals not as hard. Stiff tax rate increases are masked by involved technicalities, such as computing excess profits taxes on gross income rather than on net income, after normal corporation taxes.

The Treasury may make an effort to have its suggestions included in the bill, but likely this will be done before the Senate Finance committee, rather than the House group. Chief objective of the Treasury is an excess profits tax plan, once rejected by Congress and resoundingly voted down by the Ways and Means committee.

The death of Senator Harrison, the chairman of the Senate Finance Committee and staunch opponent of radical New Deal taxes, increases the Treasury's chances of putting over the excess profits levy in the upper chamber.

New Chemical Warfare Arsenal

War Department has completed plans for construction of a new manufacturing arsenal to produce smoke materials and other chemical warfare agents. Plant will be located near Huntsville, Ala., and will supplement the production facilities carried on at Edgewood Arsenal, Md.

Cost of the entire project, including buildings, equipment, and engineering services, will be approximately $40,000,000. The Huntsville location was chosen after an investigation of sites in many different states. They were considered from the viewpoint of transportation facilities, proximity to materials of construction and raw materials for later operation, available electric power and fuel, and relative immunity from air attack in time of war.

New arsenal will include chemical manufacturing plants, plants for loading chemical shell, a storage depot, laboratories, shops, offices, hospital, and warehouses for receiving and shipping. More than one million square feet of floor space will be required for the manufacturing operations.

The arsenal when completed will be under the supervision of the Chief of the Chemical Warfare Service. Construction work which will involve the employment of several thousand persons will be carried out under the supervision of the Quartermaster General. Lieutenant Colonel Walter J. Ungethuem, Chemical Warfare Service, now on duty at Edgewood Arsenal, Maryland, has been designated as liaison officer representing the Chemical Warfare Service during the construction period.

Several thousand persons will be employed in the operation of the new establishment when it is completed. It is expected that a high percentage of the operating labor required will be drawn from the community within a radius of 25 or 30 miles of the arsenal site.

Foreign Literature DIGEST

By

T. E. R. Singer

BOLETIN DE OBRAS SANITARIAS DE LA NACION (Buenos Aires, Argentine), Vol. V, No. 45 (1941), pp. 243-48.

The water in certain sections of Argentine contains relatively high proportions of arsenic, vanadium and/or fluorine which must, of course, be eliminated before the water can be potable. It has been found that the arsenic and vanadium are contained in fairly high concentrations only in sodium bicarbonate waters and that their concentration is greater in proportion to the alkalinity of the water. However, water which is rich in calcium or magnesium salts, either the bicarbonate or the sulfate, does not contain either arsenic or vanadium. No such rule governs the presence of fluorine, for it may be present in either type of water. When all three elements are found in one source of water their elimination presents a difficult problem. The authors (R. A. Trelles and J. M. Bach) know of only one method so far which makes it possible to eliminate all three elements in one operation, but it involves precipitation with magnesium hydroxide and is not sufficiently economical. Other practical methods for the removal of fluorine are by the use of "Fluorex" or activated bauxite, but the first has no effect on either vanadium or arsenic, and the second does not settle arsenic, so that two separate purification operations are required.

Arsenic must be removed from drinking water because it gives rise to "arsenical cancer," and many waters have more than 3 mg. of arsenic per liter of water. It is believed that drinking water should not contain more than 0.15 mg. of arsenic per liter. Vanadium was found to be toxic by experimental work with white rats, although the work in this field has been limited. Fluorine, of course, affects the teeth and even causes "Osteopetrosis."

A series of experiments were conducted on the elimination of such elements from water and they are described in this article. It was found that arsenic could be removed with iron or aluminum hydroxide precipitate, or else a magnesium hydroxide or even calcium carbonate precipitate. A suspension of magnesium oxide removes the arsenic completely.

KŌGYŌ KAGAKU ZASSI (Journal of the Society of Chemical Industry), Japan, Supplemental Binding, vol. 44, No. 1. January 1941, pp. 1-3. Studies on the thermal reaction and hydrogenation of coal (VIII) Effects of liquid mediums. Kiyoshi Morikawa, Fukazo Sato and Ryonosuke Abe (In English) pp. 3-7. Gas absorption in packed towers. S. Fujita (In English) pp. 7-11. Studies on gelation of tung oil, Monzi Tatimori (In English) pp. 11-15, Acetylcellulose, Tunao Araki (In German) pp. 15-19. Researches on the burning mechanism in the rotary cement kiln, T. Yoshii (In English) pp. 19-21. Studies on the solvent extraction of Formosan petroleum oils, Sinzi Syôno. (In English) pp. 21-22. Preparation of ethylbenzene from naphthalene. Y. Kosaka and T. Dan (In English) p. 23. Separation of anthracene and carbazol from anthracene cake, Y. Kosaka, S. Takashima and A. Kayamori (In English) p. 24. Studies on glycerin as the standard liquid of high viscosity. J. Tsukamoto and Sutezo Kuriyama (In English) pp. 25-27. Synthetic materials III, On the low polymerisates of the condensation of benzene with ethylene dichloride. K. Sisido and S. Kato (In German) pp. 27-29. Studies of methacrylic resins II. Polymerisation of methyl methacrylate in toluene. R. Inove. (In English)

Sodium Sulfite and Bisulfite

The danger of oxidation of sodium sulfite or bisulfite to sulfate or sulfate in course of manufacture (*e.g.*, by reaction of sodium carbonate with sulfur dioxide) or during storage can be largely reduced, according to Silberman and Ivanov (*J. App. Chem.*, U.S.S.R., 1940, 4, 541-552), by the presence of a trace of an aromatic diamine such as *p*-phenylene diamine or dimethyl *p*-phenylene diamine. These antioxidants are effective when present to the extent of only one part per 200,000.

Markets in Review

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

By Paul B. Slawter, Jr., Market Editor

PRICES, priorities and production—that's all you hear in the talk behind markets today. Price control is the big problem at hand. Leon Henderson in his attempts to keep prices down is reported to be at the end of his patience trying to stabilize prices by voluntary methods and shortly is expected to press for Congressional legislation to expand his powers. Commodity prices and the cost of living continue to go up as did production costs last month and this. The government seemed to be pulling itself up by its own bootstraps with price control activities on one hand to avoid inflation and its establishment of higher farm commodity prices on the other.

Preliminary surveys being conducted by the Office of Price Administration and Civilian Supply may soon lead to the establishment of a chemical price division. It will serve only as a preventive for price advances because, it is felt, price advances in chemicals have been moderate. A glance at the price increases with this month's column seems to dispute the fact, however. Chief activities in chemical price control probably would be in the resale market where some of the sharpest advances have occurred.

In the field of new textile fibres, plastics, synthetic rubber, etc., the slogan is being given out, "Chemical Prices Never Go Up." Price stability is being counted on by such producers as a means of retaining newly-acquired markets. Here, the elimination of inventory problems in natural raw materials is probably the most desirable factor.

The labor problem remains a big one. A few of the strikes have been settled, more have not. The Trona strike, it seems, has had a temporary sort of settlement. The company invited men to come back under protection of militia. About 500 out of 900 seem to have answered the call and at last reports, they were concentrating on output of needed borax and potash. Sidney Hillman associate OPM director is working on a plan to give labor a stronger voice in defense policies by creation of labor committees to parallel the industry committees. This would give labor a part in production, priorities and price control policy making. How do you like that?

Incidentally, behind the difficulties in bringing price control to the automobile industry is the complexity of the product. Government in undertaking a price job here would have to dictate every detail from windshield wipers to tires. Tire prices, incidentally, are now under price control.

Priority control was established for chromium early in July as a metal vital for defense. Almost wholly dependent upon imports, the government has decided that it must act to conserve supplies which may not be replenished for months due to shipping difficulties. New chemicals on the export control list, effective July 23, are: coconut shell char, rotenone, phenol-formaldehyde resins, urea-formaldehyde resins, acetic acid, acetic anhydride, methanol and acetone.

Creation of a new priorities system seems imminent. Main purpose will be to do away with conflicting functions of OPM and OPACS. OPM will get increased priorities over all "direct and indirect" defense production. OPACS will allocate remaining supplies.

Zinc also has joined the list of strategic metals under full priorities.

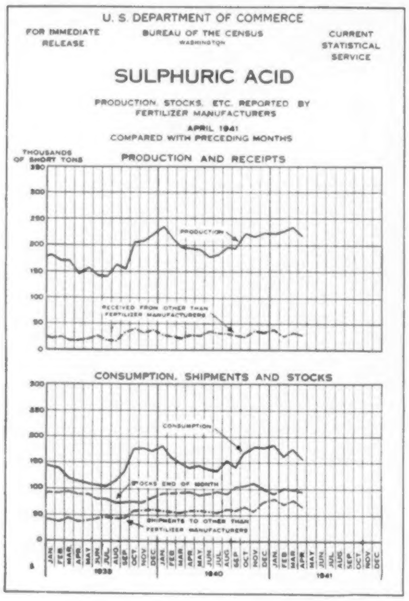
Important Price Changes

ADVANCED

	May 31	June 30
Acid, Acetic, 28% c. l., works, 100 lbs.	$2.23	$3.18
Chromic 99% dms., c.l.	.15¼	.16¼
Gallic, tech., bbls., lb.	.90	1.05
Glacial, bbls. c.l. works, 100 lbs.	7.62	8.30
Lauric, dms., lb.	.16	.17½
Pyrogallic, tech., lump, powd. c.l.	1.15	1.35
Pyrogallic, U.S.P., Cryst., lb.	1.70	2.00
Tannic, bbls., lb.	.05	.06
Albumen, egg, edible, dom., cryst., bbls., lb.	.95	1.40
Aluminum hydrate, light, bbls., c.l.	.12½	.14½
Aluminum stearate, precip., bbls., c.l., lb.	.18	.21
Aluminum sulfate		
Iron free, bags, c.l., works, 100 lbs.	1.60	1.85
Iron free, bags, c.l., works, 100 lbs.	1.80	2.05
Amyl Acetate, tks., del.	.10½	.11½
Amyl alcohol	.111	.121
Anthraquinone, lb.	.65	.70
Blood, dried, dom., bags, N. Y., unit ton	3.25	3.50
high grade, Chicago, bulk unit ton	3.15	3.65
Imp., bags, C.I.F., unit ton	2.05	3.25
Bone meal, imp., bags, ton	34.00	36.50
Calcium acetate, bags, 100 lbs.	1.90	3.00
Carbon black, bags, c.l., lb.	.03325	.03425
Casein, dom., bags, grd., lb.	.20	.21
Chrome yellow, bbls., lb.	.13½	.14½
Copper carbonate, 52-54%, bbls., lb.	.16½	.18
Copper oxide, black, bbls., lb.	.18½	.19½
Copper oxide, red, com'l., bags	.19	.20
Cresol, U.S.P., dms., c.l.	.09¾	.10¼
Dibutyl ether, l.c.l., lb.	.25	.26
Diethyl phthalate, dms., cl., lb.	.19	.20
Dimethyl phthalate, dms., c.l., lb.	.18½	.19½
Dinitrotoluene, dms., lb.	.15½	.18
Divi Divi, ton	35.00	40.00
Ethyl acetate, 85-90%, tks., lb.	.06½	.07½
Ethylene dichloride, dms., c.l., E. of Rockies, lb.	.0693	.0742
Fish scrap, dried, unground, unit	4.40	4.70
Fusel, oil, dms., lb.	.16	.17½
Glauber's salt, dom., c.l., 100 lb.	.95	1.05
Isopropyl Acetate, tks., E. of Rockies, lb.	.06½	.07½
Lead Acetate, white, broken, bbls., lb.	.11	.12
Magnesium stearate, bbls., lb.	.23	.28

ADVANCED

	May 31	June 30
Menhaden, crude, tks., Baltimore, gal.	.52½	.60
refined, tks., lb.	.088	.094
Mercury metal, 76 lb. flask, N. Y.	185.00	186.00
Methyl Acetone Synthetic, tks., gal.	.37½	.43
Oil Castor, No. 3, dms., lb.	.11	.11¼
Blown, dms., lb.	.12¾	.13¼
Chinawood, dms., lb.	.31	.32
Cocoanut, dms., edible, lb.	.11	.13
Linseed, raw, less than 5 dms., lb.	.1150	.1230
tanks, lb.	.1000	.1040
Neatsfoot, 20° C.T., bbls., lb.	.18¼	.23¾
Olive, denat., dms., gal.	3.50	3.85
foots, dms., lb.	.16	.16¾
Palm, Niger, lb.	.05⅞	.06¾
Sumatra, lb.	.05½	.06½
Perilla, dms., lb.	.18½	.19½
tanks, lb.	.17½	.18½
Rapeseed, Blown, dms., lb.	.16½	.17½
Soybean, dom., crude, dms., lb.	.10¾	.12¼
refined, tanks, lb.	.10¾	.12
Phenol, tanks, lb.	.11	.11½
Phenol, U.S.P., dms., c.l., lb.	.12	.12½
Potassium bichromate, c.l., lb.	.09	.09⅝
Potassium Permanganate, U.S.P., dms., wks.	.19¼	.20½
Potassium prussiate, yellow, bbls., lb.	.16	.17
Saltpeter, bbls., 10-20 tons, lb.	.076	.081
Sodium Acetate, bbls., lb.	.04¼	.05
Sodium Antimoniate, bbls., lb.	.14	.15
Sodium bichromate, spot, c.l., lb.	.06⅞	.07⅜
Sodium sulfate, anhy., bags, bbls., c.l., 100 lbs.	1.45	1.70
Superphosphate, 16%, bulk, ton	8.50	10.50
Tankage, fertilizer grd., unit ton	?	3.35
Tin chloride, bbls., bags, lb.	.39½	.40
Tin Metal, lb.	.52¼	.52¾
Tin tetrachloride, dms., lb.	.27¾	.28½
Titanium dioxide, bbls., c.l., lb.	.13½	.14¾
Tricresyl phosphate, tech., dms.	.22	.25
Turpentine, spirits, c.l., bbls., gal.	.50¼	.52
Wax, Bees, bleached, white, lb.	.38	.43
Wax, candelilla, bags, lb.	.22	.22½
Carnauba, yellow, No. 1, bags, lb.	.72	.75
yellow, No. 2, bags, lb.	.71	.74
Chalky, No. 3 bags, lb.	.61	.66
Zinc Stearate, bbls., lb.	.22	.25
Sulfats, cryst., lb.	3.15	3.65



Watch for: labor piracy—skilled workers are a short item . . . new producers of nickel to help nickel scarcity which stems from World War I . . . German bottleneck to come from metals . . . OPM field service to check actual use of priority metals . . . comprehensive priorities quota plan to control all shipments to South and Latin America . . . stockpile of freight cars created by government to lease or sell . . . labor priorities . . . more activities against price control evasion . . . shortage of wood pulp . . . expansion of industrial research to become a major activity of business . . . farm labor shortage and its effects to be felt . . . post-war competition between copper and aluminum . . . still no large scale synthetic rubber development —manufacturers too afraid of post-war stagnation . . . administration to remain strongly pro-labor (recent anti-strike policy just a limited outbeak) . . possibly a 10-year war (if Britain falls Hitler will wait before he attacks us; if we join Britain it will take years to drop him—so "they" say) . . . still more aluminum and magnesium production . . . more government taking over of plants.

Shipping continues to be "oh what a problem!" Despite the fact that coastwide and intercoastal operators have already given up more than half their tonnage for the government pool to ship to Britain, they will soon be asked for more. Replacements with new and faster ships will soon be made however. Freight carloadings are at the highest peak in years. There are indications that the problem of rail transportation may not be as acute as expected. Reductions in railroad freight rates are expected to be the outcome of diversion of traffic from sea lanes. Shippers are preparing to force the move.

Heavy Chemicals: Industry is still taking record shipments of industrial chemicals. Bichromates are wanted for export and everybody is trying to ascertain the immediate effect of the chrome priority on chrome products. Shortages are evident in too many branches. By order of OPM the paper industry has been curtailed in the use of chlorine with the result that all paper products containing bleached pulp will be reduced in brightness. Paper companies are asking customers to be indulgent until normal (?) conditions come back. Diminishing supplies of copper are worrying officials. About five tons are demanded by consumers for every two available to fill civilian requirements. A two-price system is expected that will bring high-cost mines into operation. Price advances as you can see in the table accompanying this comment are more apparent than ever. Chromic acid for plating, dyeing and textile processes is up. Bichromates and certain chemical solvents also are up.

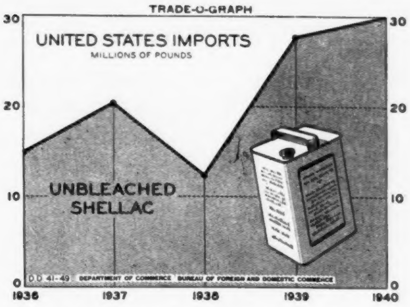
Alkalis seem to be going directly into consuming channels with all major consumers calling for larger quantities. Permanganate of potash and anhydrous manganese sulfate are higher in price. The paper industry is operating at the highest output in its history. Production fails to equal orders leaving plenty of them to fill at the end of each production month. Chemical production is running well ahead of last year. All plants are said to be operating at capacity and a great many are in the midst of expansion program. Only 10% of the government's proposed expansions, however, are said to have been completed so far. Powder plants are way ahead of schedule in most cases.

You can practically name your own shortages in any group of chemicals. One salesman we know summed up the situation quite perfectly when he said that his company was now keeping its samples of formaldehyde in the office safe. Another told about a customer who came in for oxalic acid. "We haven't a drop in the house," said the salesman, "Can I have all I find?" said the customer warily. "You sure can," said the salesman, confidently. The customer went into the warehouse and in a short time came back with about 15 of the company's sample cans in his arms. "I'm going to hold you to your word," he said, "I need anything I can get."

There has been so much demand for plating chemicals that there is no material left for sale in the open market. Carbon tetrachloride is still feeling the shortness of chlorine. Phthalic anhydride cannot be bought for love or money. Calcium chloride manufacturers report shipments 10 to 15% ahead of last year. Glass output is at a record peak so you can figure out what that has been doing to chemicals affected. Sodium fluoride prices are up. Acute shortages in potash salts are expected to be alleviated somewhat by production from the Trona plant of American Potash whose workers recently went back to work. Third quarter contract prices were subject to an upward trend. Acetic acid, when you can get it, is higher.

Fine Chemicals: Shortages and price rises are still news in this field. Mercury is extremely scarce and high in price. No indications of relief are in sight and the industry seems to have disregarded Henderson's warning that prices are too high. Methanol is harder than ever to get and this is reflected in formaldehyde and hexamethylene-tetramine. On the whole, efforts of the government to keep prices down have the full cooperation of the fine chemicals industry. In this regard, it should be stressed that without this cooperation prices would probably be much higher. However, shortages which keep getting worse and worse make any price controls seem a little useless. You can't have a fine supply of nothing and want to keep low prices on it, can you? Photographic chemicals, with the season, are going out in heavy quantities. Caffeine theobromine and tartrates are very scarce. Figures released by Spain, for instance, show that production of crude tartar products last year was 40% below normal. Citric acid is going into the manufacture of a lot of soft drinks this summer in place of tartaric. It has become virtually impossible to get actual deliveries on new orders. Old customers are being served as promptly as possible.

Coal Tar Chemicals: What's the use of talking? Here's what happened: sellers were simply overrun with orders and they had all they could do to allocate business among regular contract customers. All intermediates are under a practically restricted selling policy. By-product coke output continues upward. One producer advanced prices for all grades of cresylic acids, cresols and tar acid oils. Higher prices will apply to third quarter contracts. Cresylic and phenol were added to the critical priorities list. Rail-

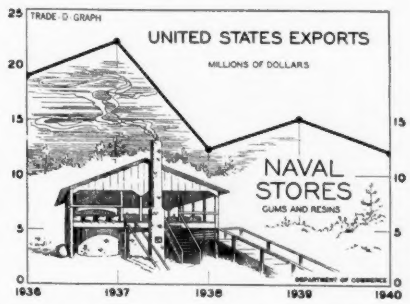


roads and utilities, as reported last month, continue to buy a lot of creosote oil.

Raw Materials: Shipping from the Far East gets harder and harder to predict. Wood and gum turpentine both saw advances as there is a threat of reduced harvest this season. Exporters of naval stores have been made apprehensive by reports that the British Government will supply rosin and turpentine requirements by securing supplies under the lease-lend act. Gum and wood rosin went under export license control July 2. High shipping prices prevailing on carnauba, candellila and Japan wax have sent prices up. Brazil reports that all grades of carnauba should be higher on the spot, but it is believed that a lot of material is being held in Brazil in anticipation of higher prices. Coconut oil continues to present a problem as far as shipping goes. There were some rumors that Danish shipping might be used to bring supplies from the Philippines but it was found that they would bring only defense supplies. Gum tragacanth stocks are quite low and replacements are indefinite. Attempts are being made to step up soybean oil production in this country and to stimulate interest in the growing of tung nut trees. Castor oil is up. Neatsfoot oils are hard to get. Most tanning materials are scarce, including tanners oils, raw tanning materials and tanning extracts.

Fertilizer Materials: Expecting its biggest year, the fertilizer industry is having a tough time filling orders, keeping old customers happy and trying to do what it can for new ones. Feed materials were bought during the last month in great quantities but there was a lot of spot buying. Sodium nitrate it is feared is rapidly diminishing in supply and importers have not as yet been able to announce new schedules. Potash salts, of course, are extremely scarce and for the first time in many years suppliers began contracting for the new season with very small stocks on hand. We are just getting piddling amounts from Europe. The Department of Agriculture has warned that next year's crops face a shortage of fertilizers. Superphosphate was boosted in price, an advance following the one made for the last period.

Paint Materials: As we've been telling you, price control talk is everywhere you go. The Office of Price Administration, for example, took action late last month to prevent a general increase of 12½% in carbon black prices for the third quarter. The mark-up had been announced for July 1, and was one in a series of advances in prices since the beginning of 1941. Henderson called a conference on it but at this writing it is not known what happened. Current stocks are estimated to be about three months supplies. Demand is well above that of a year ago. May paint sales, it has been announced, hit a new all-time high with sales of reporting establishments to the Department of Commerce totaling $56,-054,552. The trade is said to be still gathering momentum. Supplies of domestic casein are low because of the difficulty of obtaining skim milk and these milk strikes are not helping much either. Argentine casein is hard to get. Situation in other paint materials remains about the same. Lead pigment producers have been coming through with supplies but



manufacturers of all other metal colors are finding great difficulty in obtaining raw materials for the record-breaking demand. Dry colors are in about the same condition. Varnish gums and shellac also are hard to get. Due to the difficulty of securing coastwide shipping, Eastern manufacturers are no longer quoting prices at Eastern ports. Exports of paints, varnishes and lacquers from this country decreased last year over a million dollars. Exports this year are showing increases though.

Outlook: Interesting is the story of the self-sufficiency American industry has brought us in the case of salt cake, covered on page 94 of this issue. The outlook in all other cases should be no different. Irving S. Olds is quoted last month as saying:

"To my mind it is unbelievable that the United States, given a well-prepared program, the necessary time and the proper support by our people, cannot outdo anything of which Germany is capable in the way of production of the essential instruments of modern warfare."

If American industry is to do it, however, it should be let alone. Muddling bureaucracy should keep its nose out of other people's production problems. This is our only outlook and our only salvation.

How can a business man sell to the government, this department has been asked.

In order to help manufacturers solve problems of selling to the government, Jesse Jones, Secretary of Commerce, early in his administration set up a Service and Information Office.

This office is equipped to inform manufacturers whom they should contact and exactly how to do so. A manufacturer who desires to cooperate with the government in the present emergency, and lacks specific information as to how to proceed, is invited to apply to this unit, room 1060, Department of Commerce, Washington, D. C.

Many manufacturers apparently have felt that if they desire to transact business with the government they must either come to Washington in person or employ somebody familiar with government purchasing methods.

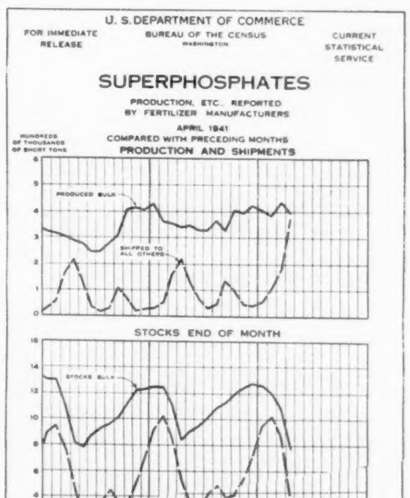
The Service and Information Office strongly urges manufacturers not to come to Washington, at least until they have carried on preliminary negotiations by mail with the purchasing agency that handles their particular products.

They are advised not to employ outsiders on a commission or other basis

The Army has decentralized its purchasing system. Different depots specialize in purchasing specific supplies. Clothing is purchased in Philadelphia; shoes in Boston; various kinds of equipment in Jeffersonville, Ind.; aircraft supplies in Dayton, Ohio. A very small percentage of Army supplies is purchased in Washington.

The Navy, too, has part of its purchasing system decentralized and prefers to have preliminary negotiations conducted by mail. The Bureau of Supplies and Accounts purchases a major proportion of Navy supplies, aside from contracting for ships.

A third large purchasing agency of the government is the Procurement Office of the Treasury Department, a centralized purchasing agency for all departments except the Army and Navy.



Salt Cake

The salt cake situation is a simple one, executives will tell you. The only thing complicated about it all is an explanation of what has happened and what is happening in the salt cake field. Salt cake, as you probably know, in its usual form is sodium sulfate. It is a by-product of several industries; the manufacture of hydrochloric acid and sodium sulfate (lumps obtained from the furnaces), the potash salts industries (Germany's production is from this source), the rayon industry and from many other fields. Natural salt cake is obtained in this country and in Canada in what appears to be increasing quantities.

Salt cake (which usually contains 92 to 99% sodium sulfate and some sodium bisulfate, calcium sulfate, iron sulfate, iron oxide, magnesium sulfate, silica and sodium chloride in impurities) is used in paper pulp, water glass, plate and window glass, sodium salts, ceramic glazes, ultramarine, diluting dyes, soap, detergent compositions.

Before the present war this country imported, roughly speaking, about 200,000 tons of salt cake a year. It uses, also roughly speaking, about 500,000. In about 1924 the European salt cake producing countries formed an international cartel for selling their product. Germany, which produces in one of its huge industries, enough salt cake to supply this country alone, was given the U. S. as a market, England got Scandinavian countries. Also included in the cartel were Belgium, France, the Netherlands and Chile. With the outbreak of war there was a mild sort of panic in the salt cake industry here and for a while there was some pretty wild buying and stocking of inventories. The price went way up. Soon it appeared that the panicky feeling was a little premature. American industry had foreseen the situation, although somewhat unwittingly, and had already begun to make up for the slack. One of the large heavy chemical manufacturers, for instance, had been working on a synthetic salt cake for about a year before the war. It was this company's intention to produce a few thousand tons a year at its Louisiana plant for the Southern paper mills. With the outbreak of war and the concurrent shortages of imported salt cake, this company stepped up production and now is producing, it is said, at the rate of over 100,000 tons a year.

Other companies stepped up production. Other companies were formed. One is being formed in Utah, one in the Ozarks. Another was formed at Monse, Wash., for supplying the great northwestern paper mills. More attention was given to salt cake recovery equipment, which though expensive, will save a big mill enough to pay for the equipment in time. Attention also is being centered on rayon mill production which is soon expected to be another good factor in the salt cake industry.

Our only imports of salt cake now are coming from England, one figure mentioned indicating a rate of about 30,000 tons a year. The struck plant at Trona has been a great factor in the salt cake industry. Its production was estimated at about 60 to 70,000 tons a year. With the strike, of course, shipments and production were immediately curtailed. Settlement of the strike this month is not expected to have an immediate effect upon salt cake shipments, however, as the government wants borax and potash from the plant.

There have been several substitutes offered. The salt cake being produced by the company in Louisiana is soda ash and sulfur, sintered. Use of this product entails some changes in production at the mills but it has been entirely satisfactory and, in fact, the savior of the saltcake industry.

Biggest factor in the salt cake situation has always been freight rates which are about twice the cost of the product itself.

After the war, the salt cake picture will be an entirely different one from the picture before. It is logical that domestic production will eliminate the need for imported salt cake.

By-production of salt cake is on the diminishing side with changed methods of manufacture springing up all the time.

(*Continued from page 37*)

of George W. Carpenter & Co., 301 Market Street, Philadelphia, a notable establishment under a famous and eccentric owner. Under his tutelage his "practical training" was thorough, and though he kept what now seem to us wickedly long hours and was well up in the standing of his class, he found time to "supe" in a number of plays and thus roused another interest which made him a devoted theatre-goer. He graduated in 1854, and instead of entering a retail pharmacy as did most of his classmates, he bravely launched out as a broker in all kinds of crude drugs, dyestuffs, and chemicals under the original proprietorship of Henry Bower.

At that time "drugs" meant a great deal more than medicinals. The word embraced definitely both the dyes, which were then all natural barks, berries, woods, and leaves, as well as the spices, which at that time were universally sold to every good housewife not only for seasoning but also for the home production of a profusion of preserves and pickles. But the drug trade did not stop there. It handled regularly paints and varnishes. It was headquarters also for all the oils, not only linseed, the great paint vehicle, but also whale oil and later coal oil, the great illuminants when gas lighting was a luxury in a few of the larger cities. It handled the industrial chemicals as well, so that our earliest chemical importers were the wholesale druggists of the seaboard centers, and as the country grew industrially, it was from the drug trade that many of our pioneer manufacturers of chemicals, paints, and later petroleum products were recruited. Out of this fertile industrial incubator and the Philadelphia College of Pharmacy was long one of the greatest foster mothers of chemists, engineers, and industrialists—came young Henry Bower. His uncle advised against his going into the retail end of the business and offered cordial and substantial co-operation as a regular customer in his venture as a broker.

There is cherished in the Bower family today a great stack of little, leather-bound, time-stained notebooks in which are neatly pasted all that young broker's receipts. The very first of these reads:

"Recv.: Jan. 24, 1855 of Mr. H. Bower six dollar and 97/100 for papering office No 7 S. front.
$6.97 Longstreth & Bro."

There are carefully saved receipts for all sorts of commodities from "bark," undoubtedly cinchona bark possibly imported for either the Rosengarten or the Farr concerns, to zinc dust surely handled as a raw material for the manufacture of zinc sulfate. The following is typical of hundreds and shows that as early as two months after opening his freshly papered office, he was dealing in what for those days were sizable quantities:

"Recd Phila., March 21, 1855 of Mr. Henry Bower—Two hundred and fifty-five 69/100 in full of all demands for four cases of Oil of Lemon and brokerage thereon.
$255.69 G. W. Bernadou & Bro."

Three years later, and the little receipt books by their entries for purchases of lead pipe and bricks fix the date quite definitely as 1858, Henry Bower added manufacturing to his trading activities. He had made a place as a supplier of raw materials for the far-flung activities of the drug trade, and with such an established patronage, he logically began manufacturing for these same customers.

His first product was aqua ammonia recovered from the gas works' crude liquors. Today, when the bulk of both from gas and coke plants by-product ammonia is converted into sulfate and used as fertilizer material, it seems strange that Henry Bower's sole domestic outlet was as the starting point for the manufacture of medicinal ammonium salts. A little later Charles Lennig began to buy for his production of ammonium alum. Eventually Bower sold the first ammonia used in the Solvay plant at Syracuse, but in the early days a surplus developed that could not be absorbed in his limited domestic market and he accordingly began exporting through the famous Peter McQuie & Son of Liverpool. This export connection carried on through three generations and was only terminated when, after the World War, the McQuie house, all its heirs having been killed at the front, decided to close up.

A Business Idealist

All this foreign business, and to the export of ammonia were later added important imports of raw materials both from England and Germany, was carried on for many years by correspondence without misunderstanding largely because Henry Bower made an exacting ideal of business ethics the basis of all his dealings. What was fair was to him right; what was unfair was not to be tolerated. He was naturally more co-operative than combative. He formed his own opinions and expressed them in no uncertain terms; he was thoroughly dependable either as a buyer or a seller and was a good competitor. Naturally he had many close business friends—all of the Harrisons, the elder Lennig, the Cochranes and Howards in New England, and closest of all William Weightman, his own uncle's great competitor.

Being at once competent and popular he was called frequently to public service. Because of his knowledge and famous impartiality, he was chosen by the Government to prepare the Chemical Sections of the Census both in 1880 and 1890. A deep student of economics, he was strongly in favor of protective principles and he was frequently called to Washington, not only to testify at Congressional hearings, but also to confer with such leaders as Judge Kelley, Congressman Randall, Senators Allison and Morrill of Vermont, and President McKinley.

Through a succession of offices he served the Manufacturing Chemists' Association faithfully and unselfishly for many years. Like several other members, Henry Bower was a real epicure and in the days when the membership was smaller and the meetings more

informal, the dinners of the Manufacturing Chemists were rare treats. He relished these gatherings, both for feasts and friends, yet he could not resist making them the point of one of his caustic witticisms. He had just been re-elected Secretary and in answer to a fulsome speech praising his work, he rose and said: "Gentlemen, I have now sat for many years at the feet of the mighty of the American chemical industry; and I must confess to you that during that time I have absorbed much delicious food, many glasses of champagne, a great collection of good stories, but very little wisdom!"

His fondness for "delicious food" took the practical turn of a hobby for cooking. His great specialty was wild turkey, and every autumn his dinners out at Bala at the exclusive "Rabbit"—a little club of Philadelphia gourmets so exclusive that it has become almost an heredity privilege—were real events in the lives of his good friends.

These honors and festivities came after Henry Bower had won his own high place in the chemical industry. For he went on from a maker of ammonia to become very shortly after 1860 a refiner of glycerine. Again he was supplying his old customers among the fine chemical manufacturers, for the pharmaceutical then far exceeded the industrial demand and the use as an explosive was still undiscovered. In glycerine he scored his first conspicuous chemical triumph, for he himself perfected the old refining process so that for the first time it was possible to make a chemically pure completely inodorous product. For this contribution to chemical technique he was awarded the Elliott Cresson medal of the Franklin Institute in 1878.

After the familiar habit of chemical makers, hardly had he smoothed out the operation of his glycerine refinery before he added new products. He now stepped out of the fine chemical field into the production of fertilizers.

In a little booklet advertising "Bower's Complete Manure," issued in 1867, he offered what we should today recognize as a "high test chemical fertilizer." It was made of superphosphate, sulfate of ammonia, mixed potash salts, in a ground limestone carrier "without adulterants." This was far ahead of the agricultural practice of his days—ahead, indeed, of most present day fertilization methods—and he preached it as would a college-trained county agent today. He described in detail the results of ten years' careful fertilizer tests scientifically conducted in which twenty grains of the same wheat, weighing the same, were sown in calcined sand, watered with distilled water, in four plots, one with sand alone, the others in sand with ammonia, in sand with phosphate, potash and lime, and in sand with phosphate, potash, lime, and ammonia. Upon the basis of these experiments he had put his formula together and made his recommendations. The booklet also sets forth experiments by Professor Booth which forecast modern work being in pasture fertilizing. In fact, since the fertilizer end of his business never grew to importance and was in ten years abandoned, one suspects that in this field Henry Bower paid that costly penalty which every true pioneer must always risk.

About 1870, however, he opened up other new lines that were most successful. Again he was broadening his operation, for with potassium prussiate and, in 1894 with tin tetrachloride, he entered industrial fields.

The step from fertilizers to prussiates was not such a long one as it now seems, for the potash salts and the ground hoofs and horns were all common raw materials. The potash came from Germany, at first bought through A. Klipstein & Company in New York and later imported direct from Vörster and Grueneberg of Cologne. In the old pot process, carbonate of potash was melted in an iron pot into which was then fed, horns, hoofs, leather scraps, all of which were cheap byproducts in 1870, but for which the firm paid as high as twenty-one dollars a ton in 1910 when they discontinued prussiate production.

Like the prussiates, the tin tetrachloride was largely used in the textile industry, and this became a leading Bower product. In 1894 thanks to this item, Bower was operating the largest chlorine plant in America with an annual output of 30,000 pounds, or less than the daily production of most present-day plants.

Kalion Chemical Organized

For the next decade there was little change in the operations, but in 1882, Henry Bower joined with John Harrison and Henry Pemberton in the manufacture of potassium bichromate by a new process developed by Pemberton. They organized the Kalion Chemical Company; built a little plant on Gray's Ferry Road just below the Bower works; bought $20,000 worth of California chrome ore. However, the Pemberton process did not prove out. He accordingly gave back the third interest he had received for it to his partners, and the operation was turned over to the orthodox method. Ten years later Henry Bower bought out the Harrison interests in the Kalion Company, but in the meantime there had been other important changes within his own company. Two of his sons and a son-in-law had joined him in business.

Henry Bower had married Lucretia Kirk Elliott on May 5, 1862, and by this marriage had strengthened the chemical traditions of the family. For his bride was a daughter of Isaac Elliott, the son of Daniel, the grandson of that John Elliott who came to Philadelphia from England and in 1754 opened a drug store where quite in the modern style he sold mirrors. From selling mirrors to repairing them was an easy transition; and from drugs and quicksilver his grandsons, John and Daniel, expanded the family business into a straight chemical manufactory. In 1834 they sold out to John Carter and Joseph Scattergood. There is an undated memorandum in John Carter's precise handwriting that reads:

Henry Bower and his wife, the great granddaughter

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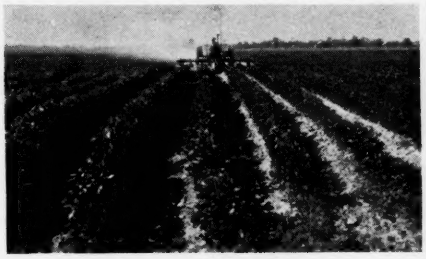
U.S.I. CHEMICAL NEWS

July ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1941

Drying Properties Of Oils Improved By New Technique

Conjugation of Double Bonds Carried Out in Alcohol Medium

MINNEAPOLIS, Minn.—A high degree of success in the solution of the problem of finding adequate substitutes for tung oil during the current shortage is promised by a novel technique for improving the drying properties of such oils as soybean, linseed, and sunflower, as well as a number of fish oils.



Soybeans are one of the sources of oils whose drying characteristics can be improved by a new technique utilizing an alcohol medium.

The process, described in a patent granted to an inventor here, consists in converting the unconjugated double bonds into conjugated ones by refluxing the oils with a basic reagent in a substantially non-aqueous medium. The ethylates and butylates of sodium, potas-

(*Continued on next page*)

A new bulletin describes formulas and methods of testing various types of writing, stamping, marking, and printing inks. U.S.I. will gladly refer readers to a source from which the bulletin can be obtained.

Tests Sealed Containers For Leaks with Solid CO_2

EVANSTON, Ill.—A novel way of testing the efficiency of container sealing operations, which has won a patent for an inventor here, makes use of pellets of solid carbon dioxide ("DRY-ICE"*).

The pellets are introduced into containers, which are then sealed in the usual way. The containers are immersed in water, and as the solid carbon dioxide evaporates, it creates a pressure inside the container. If the seal is defective, the carbon dioxide gas will escape, causing bubbles in the water.

* Manufactured and supplied by Pure Carbonic, Incorporated, an associated company of U.S.I.

Suggest Damar Resin To Parchmentize Heavy Paper

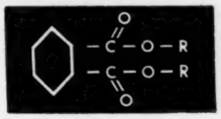
BROOKLYN, N. Y.—Heavy paper can be treated to resemble parchment with the aid of a solution of Damar resin in linseed oil and turpentine, it has been discovered here. The Damar resin possesses the desirable features of paleness and excellent color retentivity. Addition of about 10% ethyl cellulose helps prevent the Damar from becoming tacky under the effects of heat, as when the parchmentized paper is used in lamp shades.

Novel Applications Discovered For Versatile Phthalic Esters

Newly-Revealed Uses Range from Softening Synthetic Rubber To Extreme-Pressure Lubrication and Coloring of Plastics

Adhesives and printing inks, plastics and lubricants are just a few of the fields in which new uses are being found for the popular phthalic esters. Long established among the most satisfactory of lacquer plasticizers, the alkyl phthalates are daily giving new proof of their versatility by their entry into new fields.

Just recently, for example, it became known that butyl phthalate may be successfully employed as a softening agent in one of the new types of synthetic rubber, particularly when it is desired to increase resilience, or when a product free from plasticizer odor is needed.



ALKYL PHTHALATE

While the phthalates have been widely employed as plasticizing agents in plastics, an entirely new aspect of their use in this field has just been revealed in a recent patent, which describes a process for coloring plastics by employing butyl phthalate as a solvent for a colored concentrate. In the lubrication field, both ethyl phthalate and butyl phthalate are being employed in extreme-pressure lubricants where it is desired to prevent "seizing."

Adhesives are another application in which the phthalates are finding increasing utility. Butyl phthalate is employed in a patented adhesive for joining leather, in which the tendency toward cold flow is said to be prevented by the addition of powdered metals.

In Surface Coatings

Even in such well-established fields as surface coatings, new uses are constantly being found for the phthalates. Recent patents show that ethyl phthalate is recommended for use in producing decalcomanias that are opaque when dry but become transparent when wet; butyl phthalate in a new moisture-proof coating for cellulosic material and in a nitrocellulose-base ink for printing on textile materials.

The reasons for the growing popularity of the phthalates are not hard to find. Butyl phthalate and amyl phthalate have long been among the preferred nitrocellulose plasticiz-

(*Continued on next page*)

Improves Molded Bearings By Using Alcohol Varnish

GLEN ELLYN, Ill.—Marked improvements in the manufacture of heavy-duty bearings of the resinous type are promised by a new process employing a loose fibrous filler and an alcoholic solution of the resin.

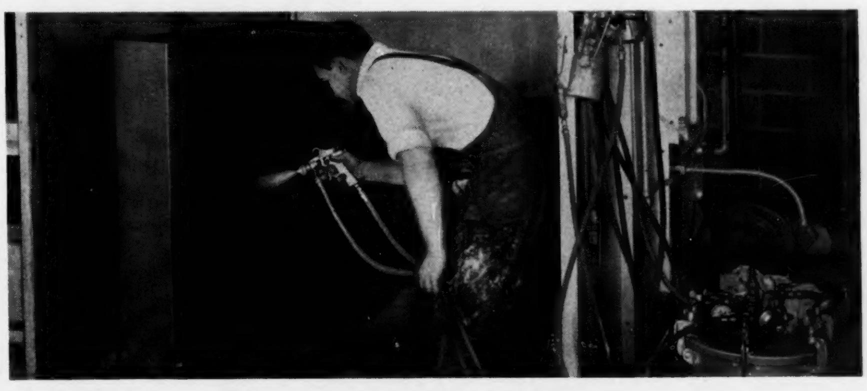
Use of the alcoholic solution, it is disclosed in patent papers recently issued on the process, offers a number of desirable features. The alcohol solvent helps to distribute the resin rapidly through the fibrous mass, and aids in the coating and penetration of each individual fiber.

A preferred method for preparing the product so that it will be highly resistant to dimensional change is to treat the fibers first with a water-soluble resin varnish, dry the water out of the mass, and then to mix the fibrous mass with the alcohol solution.

The composition thus prepared, the inventor points out, can be molded almost to final shape, so that only a relatively small amount of machining is required.

Paint Containers Studied

WASHINGTON, D. C.—Studies are being carried on with a view to determining the possibility of conserving metallic tin by changes in the containers used for paints and other surface coatings. The use of terne plate containers for linseed-oil base paints gives satisfactory results in many cases, but so far no definite recommendations have been made for the packaging of shellac, white synthetics, and a number of other special products. Studies in this direction are now under way.



Plasticizing of surface coatings is one of the most widespread applications of the popular alkyl phthalates, which are constantly broadening their field of industrial utility.

Lustrous Pearl Finishes Show Gain in Popularity

NEW YORK, N. Y.—Lacquer finishes that produce a pearly luster on finished products are reported showing substantial gains in popularity, and are being used to boost the merchandising appeal of a wide variety of articles. A contributing factor in the interest in the pearly lacquers is the shortage of metal powders which have been used to produce somewhat similar effects.

Lacquers of this type can be produced with relative ease by the addition of pearl essences to lacquer formulations. Nitrocellulose lacquers are the best starting point for these pearly finishes, although special types of pearl essence are available for incorporation in cellulose acetate lacquers. Best results are reported to be obtained by adding the lacquer to the pearl essence and stirring continually until a homogeneous solution is obtained. The essences apparently do not affect the plasticity of the lacquers and are non-corrosive to metals.

U.S.I. will gladly refer readers to a source of pearl essences.

Improved Drying Oils

(*Continued from previous page*)

sium, and lithium are suggested as basic reagents, and ethanol and butanol as the non-aqueous mediums. When the oils are treated in this way, the conjugation of the double bonds proceeds rapidly, and the reaction is easily controlled. Results of tests performed on a variety of oils indicate that by continuing the process the amount of conjugation can be raised to any desired degree up to the theoretical maximum.

Because of their higher degree of conjugation, the treated oils are regarded as superior to natural oils as ingredients in film-forming compositions.

Cold-Weather Cement Mix

WASHINGTON, D. C.—Cement construction during cold weather is facilitated by mixing the cement with a non-aqueous liquid of low freezing point instead of with water, according to a recent patent. A typical liquid is a mixture of ethanol and methanol, with the preferred proportions ranging from 75 to 88% by volume of the ethanol. Mixtures of toluene with blends of ethanol and methanol can also be employed.

Charred Documents Made Legible by New Process

LONDON, England—A novel solution to one of the most difficult problems in crime detection—that of restoring the legibility of charred documents—has been described by research workers here.

The charred pages are covered with a 25% solution of chloral hydrate in alcohol, and dried at 140° F. The process is repeated several times until a mass of chloral hydrate crystals appears on the surface, and the paper is then given a final treatment with a similar solution to which 10% of glycerin has been added. After drying, the document can be photographed for permanent record.

New Uses for Phthalates

(*Continued from previous page*)

ers, because of their good solvent power, permanence, light-fastness, compatibility with other lacquer constituents, and freedom from color, odor, and taste.

The excellent solvent powers of butyl phthalate and amyl phthalate are a double advantage in lacquer formulation. They permit the use of smaller quantities of solvent per pound of the dry material, and they result in better flowing out and leveling in the later stages of film drying, so that less of the expensive slow-evaporating solvents need be used.

Both amyl phthalate and butyl phthalate have the effect of lowering the viscosity of nitrocellulose solutions, in contrast to blown castor oil, which actually increases the viscosity.

Uses of Ethyl Phthalate

While ethyl phthalate is also a good nitrocellulose plasticizer, it is less widely used for this purpose than the amyl and butyl esters, because of its somewhat higher vapor pressure. It is extensively used as a plasticizer for cellulose acetate plastics, as is methyl phthalate, and because of its fixative properties, it is often employed in perfumes. Other uses of ethyl phthalate include insecticide sprays and synthetic resins.

U.S.I. was responsible for the introduction of amyl phthalate, and has been a leader in consistently improving the quality of the butyl, ethyl, and methyl phthalates, so that today users are assured of products of a high degree of purity. U.S.I. welcomes the opportunity to give more detailed information on the alkyl phthalates for specific applications.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

New white pigments are 33% more effective in hiding power and opacity than previous types, according to the manufacturer, who describes the pigments as produced by altering crystalline structure of titanium dioxide. **(No. 470)**

U S I

A novel centrifuge is reported to embody the principle of retaining the tubes at a fixed angle, thus accelerating the rate of sedimentation compared with conventional centrifuges. Maker points out that because of fixed angle, particles need not pass through entire depth of liquid, but only to side of tube. **(No. 471)**

U S I

A viscosity tester is provided with a set of interchangeable spindles that are reported to permit readings up to 30,000,000 centipoises. Basis of operation is the measurement of the drag on a cylinder rotated at definite speed in the liquid under test. **(No. 472)**

U S I

A new paint is said to withstand the action of all acids, salts and alkalis, including concentrated nitric, sulphuric, hydrochloric, hydrofluoric, and chromic acids, but not concentrated acetic or formic acid. **(No. 473)**

U S I

A new mixer is said to be especially suitable for manufacturing paints, lacquers, dyes, emulsions, pastes, and many other products where a large number of relatively small batches must be prepared. Maker claims that it combines grinding, dispersing, and thinning operations. Mixer is used with removable containers with capacities of 5 to 50 gallons. **(No. 474)**

U S I

Impregnated graphite pipe is corrosion-resisting, does not contaminate hot hydrofluoric acid, phosphoric acid, or hydrogen peroxide, resists decomposition to 800° F. in an oxidizing atmosphere, can be used to 1,100° F. in non-oxidizing atmosphere, according to a recent announcement. Pipe fittings of the same material are available. **(No. 475)**

U S I

Concentration of solutions can be measured by a new instrument, which can be adapted to operate a signal or corrective means if concentration exceeds predetermined limits, it is reported. Instrument is said to operate by measuring the solution conductivity. **(No. 476)**

U S I

Water-coolers are now made explosion-proof, so that they may be safely used in paint factories, oil refineries, and other locations where conditions may be hazardous, it has been announced. **(No. 477)**

U S I

A synthetic rubber-like material is said to be available in the form of transparent or translucent films in a variety of colors. Suggested applications include waterproofing and packaging materials, electrical insulations, and laminating chemical containers. **(No. 478)**

U S I

A new moisture detector for determining if surfaces are dry enough for painting is said to be applicable to both plaster and wood surfaces. Moisture range is read directly. **(No. 479)**

of the first Elliott, had five children, one of whom, the first born, a girl, died quite young. There were three sons: William H., George R., and Frank B. Bower, all of whom have served in executive capacities in the business enterprises of their father; and a daughter, Elise Elliott Bower, whose late husband, Sydney Thayer, served as Secretary and Treasurer of the company for many years.

William Henry Bower was born June 13, 1864, the first son of Henry and Lucretia Elliott Bower, and graduated from the University of Pennsylvania in 1885. After having specialized in chemistry for four years, he took an extra year's special work in mining engineering. The Kalion Company's growth suggested that it would be highly advantageous to control their own supply of chrome ore, and this post-graduate course was undertaken by the young Bower heir with this definitely in mind. The following year he prospected the chrome fields of this continent, in California and Canada, and he was present in Quebec soon after the opening of the famous Thetford Asbestos Mine. He returned to Philadelphia in 1886, and went into the laboratory of the Bower works, making analyses and routine tests. From laboratory boy, he worked his way upwards through the manufacturing departments and for many years was the active head of production.

George R. Bower Becomes President

The second son, George Rosengarten Bower, was born August 1, 1866, and after graduating from the University of Pennsylvania, came straight into the family business, serving as assistant to his father in the commercial end. He took more and more responsibilities from his father's shoulders, and became the guiding force of the company, throughout the years of its expanding activities, and served as its President from the year of incorporation, 1906, until his death in 1919. Previous to the incorporation of the Henry Bower Chemical Manufacturing Company, George Bower served as the President of its predecessors: the Ammonia Company of Philadelphia, the Kalion Chemical Company, and the Baltimore Chrome Works. He married Agnes Lee Fuller, and they had two sons, George and Henry. Henry is now the President of the Henry Bower Chemical Manufacturing Company.

The next eldest, Henry Bower's daughter, Elise Elliott Bower, born November 2, 1868, married Sydney Thayer, the son-in-law who was for many years connected with the commercial end of the business as Secretary and Treasurer, until his death in 1932. Their son, Sydney Thayer, Jr., is the present Vice-President and Treasurer of the company.

The youngest of the family, Frank B. Bower, was born February 4, 1871, and attended the University of Pennsylvania, engaging in the Mechanical Engineering course. After leaving college, he also entered the employ of the company, and for many years served in the capacity of Vice President, his principal function being in the production end of the business, which he and his brother, William, supervised during many years of successful operation. While Frank Bower resigned his executive position several years ago when the management of the business came more and more in the hands of the younger generation, he has constantly maintained his active interests in the company's affairs, and still serves as one of its directors.

The present company stems back to the individual proprietorship which was followed by the partnership of Henry Bower & Son, which due to financial difficulties in 1887, was re-organized as the Ammonia Company of Philadelphia. It was during these hard times that Henry Bower's gift of inspiring the confidence and respect of his business friends stood him in good stead, for they rallied to his defense, and led by William Weightman helped him to make a splendid and substantial recovery. Having seen his business again firmly established, he died ten years later, on March 26, 1896.

That Henry Bower, his associates and heirs did not hold lightly the confidence placed in them by their friends at this time is clearly indicated by the record of the steadfast and conscientious manner in which they discharged the financial obligations they assumed in order that their creditors might avoid substantial losses. During the period from 1887 to 1902 the re-organized company was busily engaged in re-establishing its business and paying off in full the obligations incurred.

Baltimore Chrome Works

After the founder's death in 1896 the solid foundations he had laid down supported further expansion and consolidation. In 1902 the same William Weightman who had rallied to his old friend's assistance in 1887 was sufficiently enthusiastic at the results achieved by the re-organized company, to loan the Kalion Company upwards of one million dollars, to purchase the Baltimore Chrome Works. As these interests were shortly consolidated in the Mutual Chemical Company of America, that story belongs properly to the pioneers, Isaac Tyson, Frederick W. White and Herbert M. Kaufmann.

Modern History of the Company

In 1906 the Ammonia Company and the Kalion Company were merged fittingly under the name of the Henry Bower Chemical Manufacturing Company. In 1911 the Bower interests absorbed their ancient rival, Carter and Scattergood, who had in 1834 purchased the business of Isaac Elliott, Henry Bower's father-in-law; so that sons, William, George and Frank, born on Pine Street, Philadelphia, almost on the site of John Elliott's second factory, thus united to their father's enterprise the business founded by their mother's great-grandfather.

Heavy Chemicals, Coal-Tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.*

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - June 1941 $1.06

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Acetaldehyde, drs, c-l, wks lb.	...	.11	...	.11	...	.11
Acetaldol, 95%, 55 gal drs wks lb.	.11	.12	.11	.12	.11	.25
Acetamide, tech, lcl, kgs lb.	.28	.30	.28	.30	.28	.50
Acetanilid, tech, 150 lb bbls lb.	.31	.36	.29	.31	.27	.31
Acetic Anhydride, drs, f.o.b. wks, frt all'd lb.	.10½	.11½	.10½	.11½	.10½	.11½
Acetin, tech, drs lb.	...	.33	...	.33	...	.33
Acetone, tks, f.o.b. wks, frt all'd lb.	...	.07	.06	.07	.05	.06
drs, c-l, f.o.b. wks, frt all'd lb.	...	.08½	.07½	.08½	.06½	.07½
Acetyl chloride, 100 lb cbys lb	.55	.68	.55	.68	.55	.68
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.	3.18	3.43	2.23	3.43	...	2.23
glacial, bbls, c-l, wks 100 lbs.	8.30	8.55	7.62	8.55	...	7.62
glacial, USP bbls, c-l, wks 100 lbs.	10.25	11.00	10.25	11.00	...	10.25
Acetic Acid Glacial, *Synthetic* 99.5%, cbys, cases, delv lb.	...	.0843	.0843	.0918	...	...
99.5%, 110-gal dr, delv lb.	.0843	.0868	.0843	.0868	...	...
USP XI, cases, cbys, delv lb.	.1025	.11	.1025	.11	...	...
USP XI, 110-gal drs, delv lb.	.10¼	.11	.10¼	.11	...	...
CP, cases, cbys, delv lb.	.13½	.14	.13½	.14	...	...
CP, 55-gal drs, delv lb.	.13¼	.13½	.13¼	.13½	...	...
Acetylsalicylic, USP, 225 lb. bbls lb.	...	.45	...	.45	...	.45
Adipic, kgs, bbls lb.	...	.31	...	.31	.31	.72
Anthranilic, ref'd, bbls lb.	1.15	1.20	1.15	1.20	1.15	1.20
tech bbls lb.	...	.75	...	.75	...	.75
Ascorbic, bot oz.	1.85	2.10	1.85	2.10	2.25	3.00
Battery, cbys, wks 100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, 100 lb kgs lb.	.43	.47	.43	.47	.43	.47
USP, 100 lb kgs lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bulk-bgs, delv ton *a*	93.50	96.00	93.50	96.00	...	96.00
Broenner's, bbls lb.	...	1.11	...	1.11	...	1.11
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks lb.	...	.22	...	.22	...	.22
wks, lcl lb.	...	.23	...	.23	...	.23
tks, wks lb.	...	.21	...	.21	...	.21
Caproic, normal, drs lb.	.25	.30	.25	.35	.35	.40
Chicago, bbls lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs. wks lb.	.03½	...	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv lb.	.16¼	...	.15¼	.17¼	.15¼	.17¼
Citric, USP, crys, 230 lb bbls. lb. *b*	.20	.21	.20	.21	.20	.21½
anhyd, gran bbls lb. *b*	...	.23	...	.23	...	.23
Cleve's, 250 lb bbls lb.	...	.65	...	.65	...	.57
Cresylic, 50%, 210-215° C.L., HB. drs, wks, frt equal gal.	...	.76	...	...	...	...
50%, 204-206° C.L., LB, drs, wks, frt equal gal.	...	.76	...	...	...	...
Crotonic, bbls, delv lb.	.26	.50	.21	.50	.21	.50
Formic, tech, 140 lb drs lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls lb.	.24	.28	.24	.28	.24	.75
Fuming, see Sulfuric (Oleum)						
Gallic, tech, bbls lb.	1.05	1.08	.90	1.08	.75	.93
USP, bbls lb.	1.07	1.10	...	1.10	.92	.95
H, 225 lb bbls, wks lb.	..	45	..	.45	...	.45
Hydriodic, USP 47% lb.	2.42	2.44	2.42	2.44	2.30	2.42
Hydrobromic, 34% conct 155 lb cbys, wks lb.	.35	...	.35	...	.35	.44
Hydrochloric, see muriatic						
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.09	.09¼	.09	.09¼	.09	.09½
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.03¼	.02½	.03¼	.02½	.03¼
22%, light ref'd, bbls lb.	.03½	.04¼	.03½	.04¼	.03½	.04¼
44%, light, 500 lb bbls lb.	.06½	.07¾	.06½	.07¾	.06½	.07¾
44%, dark, 500 lb bbls lb.	.05½	.06¾	.05½	.06¾	.05½	.06¾
50%, water white, 500 lb bbls lb.	.10½	.11½	.10½	.11½	.10½	.11½
Lauric, drs lb.	...	.17½	.15	.17½	.12	.14½
Laurent's, 250 lb bbls lb.	...	.45	...	.45	.45	.46
Maleic, powd, kgs lb.	...	.30	...	.30	.30	.40
Malic, powd, kgs lb.	...	.47	...	.47	...	.47
Mixed, tks, wks N unit	.05	.06	.05	.06	.05	.07¼
S unit	.0085	.009	.0085	.009	.008	.009
Monochloracetic, tech, bbls lb.	.15	.18	.15	.18	.15	.18
Monosulfonic, bbls lb.	...	1.50	...	1.50	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; *y* Price given is per gal.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.50	...	1.50	...	1.50
tks, wks 100 lb.	...	1.05	...	1.05	1.00	1.05
20°, cbys, c-l, wks 100 lb.	...	1.75	...	1.75	...	1.75
tks, wks 100 lb.	...	1.15	...	1.15	1.10	1.15
22°, c-l, cbys, wks 100 lb.	...	2.25	...	2.25	...	2.25
tks, wks 100 lb.	...	1.65	...	1.65	1.60	1.65
CP, cbys lb.	.06½	.08	.06½	.08	.06½	.08
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.10	nom.	.10	nom.	nom.	.14
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, 300 lb bbls, wks, or N Y lb.	.10¾	.14	.10¾	.14	.10¾	.12
Phosphoric, 85%, USP, cbys lb.	...	.12	...	.12	.12	.14
50%, acid, c-l, drs, wks lb.	...	.12	...	.12	.06	.12
75%, acid, c-l, drs, wks lb.	...	.07½	...	.07½	...	.07½
Picric, kgs, wks lb.	...	.35	...	.35	.35	.40
Propionic, 98% wks, drs lb.	...	.25	...	.25	...	.25
80% lb.	...	.14	...	.14	.14	.20
Pyrogallic, tech, lump, pwd, bbls lb.	...	1.35	1.20	1.35	1.05	1.20
cryst, USP lb.	...	2.00	1.70	2.25	1.55	2.25
Ricinoleic, bbls lb.	.32	.37	.32	.37	.27	.33
Salicylic, tech, 125 lb bbls, wks lb.	...	.33	...	.33	...	.33
USP, bbls lb.	.35	.40	.35	.40	.35	.40
Succinic, bbls lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	...	.17	...	.17	.17	.18
Sulfuric, 60°, tks, wks ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks 100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks 100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls lb.	...	.64	.54	.64	.44	.56
Tartaric, USP, gran, powd, 300 lb bbls lb.	...	.63½	.46¼	.63½	.35¼	.46¼
Tobias, 250 lb bbls lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.00	2.50
kgs lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls lb.	no prices		no prices		no prices	
Albumen, light flake, 225 lb. bbls lb.	.55	.62	.55	.62	.55	.62
dark, bbls lb.	.13	.18	.13	.18	.13	.18
egg, edible lb.	...	1.40	.65	1.40	.53	.55
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.121	.111	.121	...	.111
c-l, drs, delv lb.	...	.131	.121	.131	...	.121
lcl, drs, delv lb.	...	.141	.131	.141	...	.131
Amyl, normal l-c-l drs Wyandotte, Mich. lb.	...	.25	...	.25	...	.25
secondary, tks, delv lb.						
drs, c-l, delv E of Rockies lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, l-c-l, drs, f.o.b., Wyandotte, frt all'd lb.	...	.09	...	.09	...	.09
Benzyl, cans lb.	...	.68	...	.68	.68	1.00
Butyl, normal, tks, f.o.b. wks, frt all'd lb. *d*	...	.10	.09	.10	...	.09
c-l, drs, f.o.b. wks, frt all'd lb. *d*	...	.11	.10	.11	...	.10
Butyl, secondary, tks, delv lb. *d*	...	.08	.07¼	.08	...	.07¼
c-l, drs, delv lb. *d*	...	.09	.08¼	.09	...	.08¼
Butyl, tert denat cl drs lb.	...	.12½	...	.12½	...	...
lcl drs lb.	...	.13	...	.13	...	...
tks lb.	...	.11½	...	.11½	...	...
Capryl, drs, tech, wks lb.	...	.85	...	.85	...	.85
Cinnamic, bottles lb.	2.33	2.95	2.33	2.95	2.00	2.50
Denatured, CD, 14, c-l drs, wks gal. *e*	.36½	.38½	.36½	.38½	.32½	.36½
tks, East, wks gal.	.30½	.32½	...	.26½	.25½	.26½
Western schedule, c-l, drs, wks gal. *e*	...	.40½	...	.40½	.34½	.37½
Denatured, SD, No. 1, tks,	...	.27	...	.28½	.23½	.24½

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher: *e* Anhydrous is 5c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices Current

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Alcohols (continued):						
Diacetone, pure, c-l drs, delv ....lb. *f*	.11½	.12	.09½	.12	...	.12
tech, contract, drs, c-l, delv ....lb.	.10	.11	.09	.11	...	.11½
Ethyl, 190 proof, molasses, tks ....gal. *g*	...	5.96½	...	5.96½	5.93½	5.94½
c-l, drs ....gal. *g*	...	6.02½	...	...	5.92½	6.00½
c-l, bbls ....gal. *g*	...	6.03½	...	...	6.00½	6.01½
Furfuryl, tech, 500 lb drs lb.	.20	.25	.20	.25	.25	.35
Hexyl, secondary tks, delv lb.	...	.12	...	.12	...	.12
c-l, drs, delv ....lb.	...	.13	...	.13	...	.13
Normal, drs, wks ....lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv ....lb.	...	.27	...	.27	...	.27
Isobutyl, ref'd, lcl, drs..lb.	...	.079	...	.079	...	.079
c-l, drs ....lb.	...	.069	...	.069	...	.069
tks ....lb.	...	.069	...	.069	...	.069
Isopropyl, ref'd, 91%, c-l, drs, f.o.b. wks, frt all'd ....lb.	...	.66½	...	.66½	...	.65
Ref'd 98%, drs, f.o.b. wks, frt all'd ....gal.	...	.65	...	.65	...	.65
Tech 91%, drs, above terms ....gal.	.35	.40	.35	.40	...	.33½
tks, same terms....gal.	...	.30	...	.30	...	.28½
Tech 98%, drs, above terms ....gal.	...	.44	...	.44	.36	.37½
tks, above terms...gal.	...	.37½	...	.37½	.31	.32½
Spec. Solvent, tks, wks gal.	...	.28	...	.28	.23½	.25½
Aldehyde ammonia, 100 gal drs ....lb.	.65	.70	.65	.70	.65	.82
Aldehyde Bisulfite, bbls, delv ....lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv ....lb.	.11	.12	.11	.12	.11	.12
Alphanaphthol, crude, 300 lb. bbls ....lb.	...	52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls ....lb.	...	.32	...	.32	.32	.34
Alum, ammonia, lump, c-l, bbls, wks ....100 lb.	...	3.75	...	3.75	...	3.75
delv NY, Phila ...100 lb.	...	3.75	...	3.75	...	3.75
Granular, c-l, bbls wks ....100 lb.	...	3.50	...	3.50	...	3.50
Powd, c-l, bbls, wks 100 lb.	...	3.90	...	3.90	...	3.90
Chrome, bbls ....100 lb.	no prices		no prices		6.50	6.75
Potash, lump, c-l, bbls, wks ....100 lb.	...	4.00	...	4.00	...	4.00
Granular, c-l, bbls, wks ....100 lb.	...	3.75	...	3.75	...	3.75
Powd, c-l, bbls, wks 100 lb.	...	4.15	...	4.15	...	4.15
Soda, bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
Aluminum metal, c-l, NY 100 lb.	17.00	18.00	17.00	18.00	18.00	20.00
Acetate, 20%, bbls ....lb.	.08	.09	.08	.09	.07½	.09
Basic powd, bbls, delv lb.	.35	.50	.35	.50	.35	.50
32% basic, bbls, delv lb.	.09½	.12	.09½	.12	...	...
Insoluble basic powder, bbls, delv ....lb.	.35	.40	.35	.40	...	...
Soluble normal pwdr lb.	...	.33	...	.33	...	...
Soluble basic powder lb.	...	.33	...	.33	...	...
Chloride anhyd 99% wks lb.	.08	.12	.08	.12	.08	.12
93%, wks ....lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks ...lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv ....lb.	...	.13	...	.13	...	.13
Hydrate, 96%, light, 90 lb. bbls, delv ....lb.	...	.14½	.12½	.14½	12½	.13½
heavy, bbls, wks ....lb.	.029	.03½	.029	.03½	.029	.03½
Oleate, drs ....lb.	.17½	.20	.17½	.20	.16¾	.20
Palmitate, bbls ....lb.	.20½	.21½	.20½	.21½	.20½	.24½
Resinate, pp., bbls ....lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls ...lb.	...	.21	.18	.21	.19	.20
Sulfate, com, c-l, bgs, wks ....100 lb.	...	1.15	...	1.15	...	1.15
c-l, bbls, wks ....100 lb.	...	1.35	...	1.35	...	1.35
Sulfate, iron-free, c-l, bags, wks ....100 lb.	...	1.85	1.60	1.85	1.60	1.80
c-l, bbls, wks ....100 lb.	...	2.05	1.80	2.05	1.65	1.80
Aminoazobenzene, 110 lb kgs lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd fert com, tks lb.	...	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
50 lb cyl ....lb.	...	.22	...	.22	...	.22
26°, 800 lb drs, delv ...lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 ..cont.	...	.05¼ z	.04	.05¼ z	.04	.05¼
Ammonium Acetate, kgs ..lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks ....100 lb.	.0564	.0614	.0564	.0614	...	.0564
Bifluoride, 300 lb bbls ..lb.	.15	.16½	.14	.16½	.14½	.16½
Carbonate, tech, 500 lb bbls ....lb.	.08¼	.09¼	.08¼	.09¼	.08¼	.11
Chloride, White, 100 lb bbls, wks ....100 lb.	4.45	...	4.45	...	4.45	4.90
Gray, 250 lb bbls, wks ....100 lb.	5.50	5.75	5.50	5.75	5.50	6.25
Lump, 500 lb cks spot lb.	no prices		no prices		no prices	
Lactate, 500 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls ....lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls ....lb.	...	.12	...	.12	...	.12
Naphthenate, bbls ....lb.	...	.17	...	.17	...	.17
Nitrate, tech, bbls ....lb.	.0435	.0455	.0435	.0455	...	.0455
Oleate, drs ....lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls ....lb.	.19	.25	.19	.25	.19	.25
Perchlorate, kgs ....lb.	no stocks		no stocks		no stocks	
Persulfate, 112 lb kgs..lb.	.21	.22	.21	.22	.21	.22

f Prices are 1c higher in each case.
g Grain alcohol 25c a gal. higher in each case. ** On a delv. basis.
z On a f.o.b. wks. basis.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Ammonium (continued):						
Phosphate, diabasic tech, powd, 325 lb bbls ....lb.	.07¼	...	.07¼	.09¼	.07¼	.10
Ricinoleate, bbls ....lb.	...	15	...	.15	...	.15
Stearate, anhyd, bbls...lb.	...	.24½	...	.24½	...	.24½
Paste, bbls ....lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom, f.o.b., bulk ton	29.00	30.00	29.00	30.00	...	29.00
Sulfocyanide, pure, kgs..lb.	...	.65	...	.65	...	.65
Amyl Acetate (from pentane) tks, delv ....lb.	...	.115	.105	.115	...	.105
c-l, drs, delv ....lb.	...	.125	.115	.125	...	.115
lcl, drs, delv ....lb.	...	.135	.125	.135	...	.125
tech drs, delv ....lb.	...	.11½	.11½	.12	...	.12
Secondary, tks, delv..lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv ....lb.	...	09½	...	.09½	...	.09½
tks, delv ....lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks ib.	.56	68	.56	.68	.56	.68
mixed l c l drs, wks lb.	...	.07	.0565	.07	.0535	.0665
tks, wks ....lb.	...	.05	.0465	.05	...	.0465
Mercaptan, drs, wks ...lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs....lb.	...	.25	...	.25	...	.25
Stearate, lcl, wks, drs..lb.	...	.26	...	.26	...	.26
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.102	.11
tks, wks ....lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes						
Aniline Oil, 960 lb drs and tks ....lb.	...	.14½	...	.14½	...	.14½
Annatto fine ....lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85% ....lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls ....lb.	...	.70	.65	.70	...	.65
Antimony metal slabs, ton lots ....lb.	.14	nom.	.14	.16½	...	.14
Butter of, see Chloride						
Chloride, soln, cbys ....lb.	...	.17	...	.17	...	.17
Needle, powd, bbls ....lb.	...	.16	...	.16	.16	.22
Oxide, 500 lb bbls ....lb.	.12	.14½	.12	.14½	.13	.15¼
Salt, 63% to 65%, drs lb.	...	.28	...	.28	.28	nom.
Archil, conc, 600 lb bbls lb.	no prices		no prices		no prices	
Double, 600 lb bbls ....lb.	no prices		no prices		no prices	
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls ....lb.	.09½	.10	.09½	.10	.09	.10
Arsenic, Metal ....lb.	no prices		no prices		...	...
Red, 224 lb cs kgs ....lb.	no prices		no prices		.17½	.18
White, 112 lb kgs ....lb.	.03½	.04¼	.03½	.04¼	.03	.04¼
Barium Carbonate precip, 200 lb bgs, wks ....ton	45.00	50.00	45.00	50.00	45.00	62.50
Nat (witherite) 90% gr, c-l, wks, bgs ....ton	...	43.00	...	43.00	43.00	47.00
Chlorate, 112 lb kgs, NY lb.	no prices		...	.45	.20	.45
Chloride, 600 lb bbls, delv, zone 1 ....ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	...	.10	.10	.12
Hydrate, 500 lb bbls ...lb.	.05¾	.07	.05½	.07	.05½	.07
Nitrate, bbls ....lb.	.09½	.10½	.08½	.10½	.09½	.10½
Barytes, floated, 350 lb bbls c-l, wks ....ton	...	25.15	...	25.15	...	25.15
Bauxite, bulk, mines ....ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ....ton	...	16.00	...	16.00	...	16.00
200 mesh ....ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks ....lb.	.45	.55	.45	.55	.55	.60
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft-all'd gal.	...	.14	...	.14	.14	.16
90% c-l, drs ....gal.	...	.19	...	.19	.19	.21
Ind pure, tks, frt all'd gal.	...	.14	...	.14	.14	.16
Benzidine Base, dry, 250 lb. bbls ....lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs ....lb.	...	.22	.19	.22	.19	.21
Beta-Naphthol, 250 lb bbls, wks ....lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls ....lb.	1.25	...	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ....lb.	.51	.52	.51	.52	.51	.52
Bismuth metal ....lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes ....lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes ....lb.	3.10	3.19	3.10	3.19		3.10
Subbenzoate, boxes ....lb.	...	3.40	...	3.40	3.25	3.36
Subcarbonate, kgs ....ib.	1.73	1.76	1.73	1.76	1.73	1.76
Subnitrate, fibre, drs ...lb.	1.20	1.51	1.20	1.51	1.48	1.51
Trioxide, powd, boxes ..lb.	...	3.65	...	3.65	3.56	3.57
Blanc Fixe, Pulp, 400 lb. bbls, wks ....ton *h*	35.00	42.50	35.00	42.50	50.00	80.00
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	2.00	2.85	2.00	2.85	...	2.85
lcl, drs, wks ....lb.	2.25	3.35	2.25	3.35	2.25	3.35
Blood, dried, f.o.b., NY unit	...	3.50	2.40	3.50	2.25	3.35
Chicago, high grade ..unit	...	3.65	2.50	3.65	2.00	3.50
Imported shipt ....unit	...	3.25	2.45	3.25	2.25	3.30
Blues, Bronze Chinese						
Prussian Soluble ....lb.	...	.33	...	.33	.33	.37
Milori, bbls ....lb.	...	.33	.33	.34	.33	.34
Ultramarine,* dry, wks, bbls ....lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	...	.16	...	.16	...	.16
Pulp, Cobalt grade ...lb.	.22	.24	.22	.24	.22	.27
Bone, 4½ + 50% raw, Chicago ....ton	...	34.00	30.00	34.00	30.00	33.00
Bone Ash, 100 lb kgs ....lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50%, imp ton	...	36.50	31.50	36.50	31.50	32.50
Domestic, bgs, Chicago ton	34.00	35.00	32.00	35.00	29.00	32.00

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Borax, tech, gran, 80 ton lots, sacks, delv ....ton j	...	43.00	...	43.00	...	43.00
bbls, delv ....ton j	...	53.00	...	53.00	...	53.00
Tech, powd, 80 ton lots, sacks ....ton	...	48.00	...	48.00	47.00	48.00
bbls, delv ....ton	...	58.00	...	58.00	57.00	58.00
Bordeaux Mixture, drs ...lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases ....lb.	.25	.30	.25	.30	.25	.43
Bronze, Al, pwd, 300 lb drs lb.	...	.57	...	.57	...	.57
Gold, blk ....lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks ....lb.	.02½	.03	.02½	.03	.02¼	.03¾
Butyl, acetate, norm drs, frt all'd ....lb.	.10	.11	.10	.11	...	.10
tks, frt all'd ....lb	.09	.10	.09	.10	...	.09
Secondary, tks, frt all'd lb.	...	.07¼	...	.07¼	...	.07¼
drs, frt all'd ....lb.	.08¼	.08¾	.08¼	.08¾	.07½	.08
Aldehyde, 50 gal drs, wks ....lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Crotonate, norm, 55 and 110 gal drs, delv .....lb.	...	.35	...	.35	...	.35
Lactate ....lb.	...	.23½	...	.23½	.23½	.24½
Oleate, drs, frt all'd ...lb.	...	.25	...	.25	...	.25
Propionate, drs ....lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv ....lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs ....lb.	...	.28½	...	.28½	...	.28½
Tartrate, drs ....lb.	no prices		.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½
Cadmium Metal ....lb.	.90	nom.	.80	.90	.80	.85
Sulfide, orange, boxes lb.	...	1.10	...	1.10	.75	.85
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	...	3.00	1.90	3.00	...	1.90
Arsenate, c-l, E of Rockies, dealers, drs ....lb.	.06½	.06¾	.06	.06¾	.06	.07¼
Carbide, drs ....lb.	...	.04¾	...	.04¾	.05	.06
Carbonate, tech, 100 lb bgs, c-l ....ton	16.00	20.00	16.00	20.00	...	...
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv..ton	...	20.50	...	20.50	...	22.00
paper bags, c-l, delv..ton	20.50	35.00	20.50	35.00	20.50	36.00
Solid, 650 lb drs, c-l, delv ....ton	19.00	33.00	19.00	33.00	19.00	35.00
Ferrocyanide, 350 lb bbls wks ....lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls ....lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25 bbl lots, wks ....lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bags ...ton	no prices		no prices		28.00	29.00
Palmitate, bbls ....lb.	.22	.24	.22	.24	.22	.24
Phosphate, tribasic, tech, 450 lb bbls ....lb.	.0635	.0705	.0635	.0705	.0635	.07½
Resinate, precip, bbls ..lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls ...lb.	.20½	.22½	.20½	.22½	.20½	.22½
Camphor, slabs ....lb.	.73	.74	.73	.83	.82	.84
Powder ....lb.	.73	.74	.74	.83	.82	.84
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants ....lb.	...	.03425	.03325	.03425	.02¾	.03¾
lcl, bgs, f.o.b. whse ..lb.	...	.075	.07025	.075	...	.06525
Decolorizing, drs, c-l ..lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110 gal drs, c-l, delv ....lb.	...	.66½	...	.66½	...	.66½
Casein, Standard, Dom, grd lb.	.21	.22	.11½	.22	.10	.14½
80-100 mesh, c-l bgs ...lb.	...	.22	.12	.22	.11	.15
Castor Pomace, 5½ NH_3, c-l, bgs, wks ....ton	15.00	...	15.00	...	15.00	17.50
Imported, ship, bgs ....ton	no prices		no prices		...	20.00
Celluloid, Scraps, ivory cs lb.	.12	.15	.12	.15	.12	.15
Transparent, cs ....lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs ....lb.	...	.30	...	.30	.30	.34
Triacetate, flake, frt all'd ....lb.	...	.30	...	.30	...	...
Chalk, dropped, 175 lb bbls lb.	...	.02¾	...	.02¾	.02¾	.03¾
Precip, heavy, 560 lb cks lb.	...	.03¼	...	.03¼	.02¾	.03¼
Light, 250 lb cks ......lb.	...	.03¼	...	.03¼	.03¼	.04
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ..ton	25.00	36.00	25.00	36.00	25.00	36.00
Willow, powd, 100 lb bbls, wks ....lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks lb.	...	.01¾	...	.01¾	...	.01¾
25%, bbls, wks ....lb.	...	.02⅜	...	.02⅜	...	.02½
China Clay, c-l, blk mines ton	...	7.60	...	7.60	7.60	9.50
Imported, lump, blk ...ton	18.60	25.00	...	18.60	25.00	26.00
Chlorine, cyls, lcl, wks, contract ....lb.	...	.07¼	...	.07¼	.07½	.08½
cyls, c-l, contract ...lb j	...	.05¼	...	.05¼	...	.05¼
Liq. tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont ....lb.	...	.019	...	.019	...	.019
Chloroacetophenone, tins, wks ....lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks ....lb.	...	.08	.06	.08	.06	.08
Chloroform, tech, 1000 lb drs ....lb.	...	.20	...	.20	.20	.21
USP, 25 lb tins ....lb.	...	.30	...	.30	.30	.31
Chloropicrin, comml cyls ..lb.	...	.80	...	.80	...	.80
Chrome, Green, CP ......lb.	.21	.25	.21	.25	.21	.25
Yellow ....lb.	...	.14½	.13½	.14½	.13½	.14½
Chromium Acetate, 8% Chrome, bbls ....lb.	...	.05¾	...	.05¾	...	.05¾

j A delivered price; * Depends upon point of delivery.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Chromium (continued)						
Fluoride, powd, 400 lb bbl ....lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls ....bbl.	7.50	7.75	7.50	7.75	7.50	8.00
Cobalt Acetate, bbls ......lb.	...	.80½	...	.80½	...	.80½
Carbonate tech, bbls ...lb.	...	1.58	...	1.58	1.38	1.60
Hydrate, bbls ....lb.	...	1.98	...	1.98	...	1.78
Linoleate, solid, bbls ...lb.	...	.33	...	.33	...	.33
paste, 6%, drs ......lb.	...	.31	...	.31	...	.31
Oxide, black, bgs ......lb.	...	1.84	...	1 84	...	1.84
Resinate, fused, bbls ...lb.	...	.13½	...	13½	...	.13½
Precipitated, bbls .....lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs ....lb.	.38	.39	.38	.39	.38	.39
Copper, metal, electrol 100 lb.	12.00	12.50	12.00	12.50	11.00	12.00
Acetate, normal, bbls, dlvd ....lb.	...	.24	.22	.24	.22	.24
Carbonate, 52-54% 400 lb bbls ....lb.	.18	.20½	.1650	.20½	.1570	.169
Chloride, 250 lb bbls ...lb.	.16	.18	.16	.18	.16	.18
Cyanide, 100 lb drs ....lb.	.34	.36	.34	.36	...	.34
Oleate, precip, bbls ....lb.	...	.20	.	.20	...	.20
Oxide, black, bbls, wks lb.	.19½	.21	.18	.21	.18	.18¾
red 100 lb bbls ......lb.	.20	.22	.19	.22	.19½	.20½
Sub-acetate verdigris, 400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.	...	4.75	...	4.75	4.45	4.75
Copperas crys and sugar bulk c-l, wks ....ton	...	17.00	14.00	17.00	14.00	20.00
Corn Sugar, tanners, bbls 100 lb.	...	4.05	3.36	4.05	2.99	3.39
Corn Syrup, 42°, bbls 100 lb.	...	3.52	3.42	3.52	3.02	3.47
43°, bbls ....100 lb.	...	3.57	3.47	3.57	3.07	3.52
Cotton, Soluble, wet 100 lb. bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls ....lb.	...	.52½	38¼	.52½	.28¼	.38¼
Creosote, USP 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1 tks .....gal.	.13½	.14½	.13½	.14½	.13½	.14
Grade 2 ....gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l .....lb.	...	.10¼	.09¾	.10¼	.09¾	.10¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks .....lb.	...	.13	.11	.13	.11	.12
Cutch, Philippine, 100 lb. bale lb.	...	.04¾	...	.04¾	.04	.04½
Cyanamid, pulv, bags, c-l, frt all'd, nitrogen basis, unit	no prices		...	1.40	...	1.40
Derris root 5% rotenone, bbls ....lb.	.21	.23	.21	.23	.21	.30
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	...	4.00	3.80	4.00	3.40	3.80
British Gum, bgs ...100 lb.	...	4.25	4.05	4.25	3.65	4.10
Potato, Yellow, 220 lb bgs lb.	...	.08	...	.08	...	.07¾
White, 220 lb bgs, lcl lb.	.08½	.09	.08½	.09	.08½	.09
Tapioca, 200 bgs, lcl ...lb.	...	.0715	...	.0715	...	.0715
White, 140 lb. bgs ..100 lb.	...	3.95	3.75	3.95	3.35	3.75
Diamylamine, c-l, drs, wks lb.	...	.47	...	.47	...	.47
lcl drs, wks ....lb.	...	.50	.48	.50	...	.50
Diamylene, drs, wks .....lb.	.095	.102	.095	.102	.095	.102
tks, wks ....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ....lb.	.085	.092	.085	.092	.085	.092
tks, wks ....lb.	...	.075	...	.075	...	.075
Diamylnaphthalene, l-c-l, drs, f.o.b. wks, ...lb.	...	.17	.17	.20	...	...
Diamylphthalate, drs, wks lb.	.21	.21½	.21	.21½	.21	.21½
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks ....lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.53	...	.53	...	.53
c-l drs, wks ....lb.	...	.50	...	.50	...	.50
tks, wks ....lb.	.	.48	.	.48	...	.48
Dibutyl Ether, drs, wks, lcl lb.	.26	.28	.25	.28	...	.25
Dibutylphthalate, drs, wks, frt all'd ....lb.	.19	.19½	.19	.19½	.19	.19½
Dibutyltartrate, 50 gal drs lb.	...	.50	...	.50	...	.50
Dichlorethylene, drs .....lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks ....lb.	.15	.16	.15	.16	.15	.16
tks, wks ....lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks lb.	...	.04	.025	.04	...	.025
tks, wks ....lb.	...	.025	.0221	.025	...	.0221
Diethanolamine, tks, wks..lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks ....lb.	...	.70	...	.70	...	.70
Diethylamino Ethanol, l-c-l, drs, f.o.b. Wyandotte, frt all'd E. Miss. ....lb.	...	.75	...	.75	...	...
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	.40	.52
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate,, c-l, drs lb.	...	.20	.19	.20	.19	.19½
Diethylsulfate, tech, drs, wks, lcl ....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs .....lb.	.14	.15½	.14	.15½	.14½	.15½
Mono ethyl ethers, drs ..lb.	.14½	.15½	.14½	.15½	.14½	.16
tks, wks ....lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs ..lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks ....lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks ....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ... lb.	...	.16	...	.16	.16	.21
Oleate, bbls .... lb.	...	.17	...	.17	.13	.17
Stearate, bbls .... lb.	...	.22	...	.22	.22	.26
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	1.00	1.05	1.00	1.05	1.00	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24

* These prices were on a delivered basis.

Prices

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Dimethyl phthalate, drs, wks, frt all'd . . . lb.	...	.19½	.18½	.19½	...	.18½
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	.18	.19
Dinitrochlorobenzene, 400 lb bbls . . . lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls . . . lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	...	.22	.22	.23
Dinitrotoluene, 300 lb bbls lb.	...	.18	.15½	.18	...	.15½
Diphenyl, bbls . . . lb.	.15	...	.15	.20	.15	.20
Diphenylamine . . . lb.	...	.25	...	.25	.25	.32
Diphenylguanidine, 100 lb drs . . . lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	...	40.00	32.00	40.00	...	nom.
Extract . . . lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
Egg Yolk, dom., 200 lb. cases lb.	.72	.75	.60	.75	.57	.62
Epsom Salt, tech, 300 lb bbls c-l, NY . . . 100 lb.	...	1.90	...	1.90	1.90	2.10
USP, c-l, bbls . . . 100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs . . . lb.	...	.26	...	.26	...	.26
Isopropyl 50 gal drs . . . lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd . . . lb.	...	.06	...	.06	...	.06
Nitrous conc bottles . . . lb.	...	.73	...	.73	...	.68
Synthetic, wks, tks . . . lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd . . . lb.	...	.07½	.06½	.07½	.06	.06½
drs, frt all'd . . . lb.	...	.08½	.07½	.08½	.07	.08½
99%, tks, frt all'd . . . lb.	...	.07¾	.06¾	.07¾	.06¼	.08
drs, frt all'd . . . lb.	...	.08¾	.07¾	.08¾	.07¼	.08¾
Acetoacetate, 110 gal drs lb.	...	.27½	...	.27½	...	.27½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs . . . lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd . . . lb.	.45	...	.45	.50	.45	.50
Chloride, 200 lb drs . . . lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys . . lb.	...	.30	...	.30	...	.30
Crotonate, drs . . . lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd . . lb.	.25	.26	.25	.26	.23	.24
Lactate, drs, wks . . . lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks . . . lb.	...	.25	...	.25	...	.25
Oxybutyrate, 50 gal drs, wks . . . lb.	1.00	nom.	1.00	nom.	.30	1.00
Silicate, drs, wks . . . lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs . . . lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont . . . lb.	.75	.85	.75	.85	.75	.85
Anhydrous . . . lb.	...	.75	...	.75	..	.75
Dichloride, 50 gal drs, E. Rockies . . . lb.	...	.0742	.0693	.0746	.0595	.0694
Glycol, 50 gal drs, wks . . lb.	.14½	.18½	.14½	.18½	.14½	.18½
tks, wks . . . lb.	...	.13½	...	.13½	...	.13½
Mono Butyl Ether, drs, wks . . . lb.	.16½	.17½	.16½	.17½	.16½	.21
tks, wks . . . lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks . . . lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks . . . lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks . . . lb.	.11½	.12½	.11½	.12½	.11½	.13
tks, wks . . . lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks . . . lb.	.15½	.16½	.15½	.16½	.15½	.17
tks, wks . . . lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl . . . lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline . . . lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery . . . ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks . . . ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls . . . lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys . . . lb.	.06½	.07	.06½	.07	.06¼	.07
Fish Scrap, dried, unground wks . . . unit *l*	...	4.70	4.40	4.70	3.10	4.25
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis . . . unit *m*	...	2.75	...	2.75	2.25	3.50
Fluorspar, 98% bgs . . . ton	...	29.00	...	29.00	29.00	32.00
Formaldehyde, c-l, bbls, wks . . . lb.	.055	.0575	...	...	...	...
Fossil Flour . . . lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ton	...	15.00	...	15.00	...	15.00
Imp powd, c-l, bgs . . . ton	no prices		no prices		...	25.00
Furfural (tech) drs, wks lb.	...	.15	.10	.15	.10	.15
tks, wks . . . lb.	...	.09	...	.09	...	...
Furfuramide (tech) 100 lb drs . . . lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.17½	.19½	.16	.19½	.16	.17¼
Fustic, crystals, 100 lb boxes . . . lb.	...	.26	.24	.26	.24	.28
Liquid 50°, 600 lb bbls lb.	...	.11½	.10½	.14	.10½	.14
Solid, 50 lb boxes . . . lb.	.19	.21	.19	.21	.19	.21
G Salt paste, 360 lb bbls . . lb.	...	.45	...	.45	.45	.47
Gambier, com 200 lb bgs . . lb.	nom.	.09	.06½	.09	.06½	.07
Singapore cubes, 150 lb bgs . . . 100 lb.	.10½	nom.	.08¼	.10½	.08¼	.10
Glauber's Salt, tech, c-l, bgs, wks* . . . 100 lb.	1.05	1.28	.95	1.28	.95	1.18
Anhydrous, see Sodium Sulfate						
Glue, bone, com grades, c-l bgs . . . lb.	.15½	.18	.13½	.18	.13½	.15½
Better grades, c-l, bgs lb.	.18	.29	.15	.29	.15	.23

l + 10; *m* + 50; * Bbls. are 20c higher.

Current

Glycerin, CP
Hydrogen Peroxide

		Current Market		1941 Low	1941 High	1940 Low	1940 High
Glycerin, CP, 550 lb drs	lb.	...	.14½	...	.14½	...	.12½
Dynamite, 100 lb drs	lb.	...	nom.	...	nom.	...	nom.
Saponification, drs	lb.	...	.11½	.09½	.11½	.09½	.13
Soap Lye, drs	lb.	nom.	.09	.07⅛	.09	.07⅛	.08¼
Glyceryl Bori-Borate, bbls	lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls	lb.	...	.27	...	.27	...	.27
Monostearate, bbls	lb.	...	.30	...	.30	...	.30
Oleate, bbls	lb.	...	.22	...	.22	...	.22
Phthalate	lb.	...	.38	...	.38	.37	.38
Glyceryl Stearate, bbls	lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls	lb.	...	.22	...	.22	...	.22
Phthalate, drs	lb.	...	.38	...	.38	...	.38
Stearate, drs	lb.	...	.26	...	.26	...	.26
GUMS							
Gum Aloes, Barbadoes	lb.	.85	.90	.80	.95	.80	.90
Arabic, amber sorts	lb.	.18	.19	.14	.19	.08½	.15
White sorts, No. 1, bgs	lb.	.35	.36	.35	.36	.28	.36
No. 2, bgs	lb.	no prices		no prices		.27	.34
Powd, bbls	lb.	.21	.22	.18	.22	.12½	.20
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY	lb.	.04½	.05½	04½	.05½	.02½	.10½
California, f.o.b. NY, drs	ton	29.00	36.50	29.00	36.50	29.00	36.50
Egyptian, 200 lb cases, f.o.b. NY	lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases	lb.	.23	.24	.19	.20	.17	.24
Copal, Congo, 112 lb bgs, clean, opaque	lb.	...	.49½	...	.49½	...	.49½
Dark amber	lb.	...	.12⅜	...	.12⅜	.11⅜	.12⅜
Light amber	lb.	...	.17	...	.17	...	.17
Copal, East India, 180 lb bgs							
Macassar pale bold	lb.	...	.12¼	...	.12¼	.12¼	.15⅝
Chips	lb.	...	.06¾	...	.06¾	.06¾	.09
Dust	lb.	...	.05¼	...	.05¼	.04¾	.06¾
Nubs	lb.	...	.10½	...	.10½	.10½	.14⅜
Singapore, Bold	lb.	...	.15¾	...	.15¾	.14⅝	.17½
Chips	lb.	...	.08½	...	.08½	.08½	.09⅛
Dust	lb.	...	.05¼	...	.05¼	.04¾	.06¾
Nubs	lb.	...	.11	...	.11	.11	.13½
Copal Manila, 180-190 lb		..	13⅞	...	.13⅞	.13¾	.16¾
Loba B	lb.	...	.11¾	...	.11¾	.11¾	.16⅛
Loba C	lb.	...	.11¼	...	.11¼	.11¼	.14½
DBB	lb.	...	.10	...	.10	.06⅞	.12⅛
MA sorts	lb.	...	.07¾	...	.07¾	.07¾	.13¾
Copal Pontianak, 224 lb cases, bold genuine	lb.	...	.15⅜	...	.15⅜	.15⅛	.18½
Chips	lb.	...	.10	...	.10	.08⅜	.10½
Mixed	lb.	...	.14⅜	...	.14⅜	.14⅛	.16⅝
Nubs	lb.	...	.12¾	...	.12¾	.10¾	.13½
Split	lb.	...	.13¾	...	.13¾	.13½	.16⅛
Damar Batavia, 136 lb cases							
A	lb.	...	.21⅝	...	.21⅝	.21⅝	.22¾
B	lb.	...	.20¼	...	.20¼	.20⅛	.21⅛
C	lb.	...	.14⅝	...	.14⅝	.15⅝	.15¼
D	lb.	...	.13¼	...	.13¼	.13¼	.13¾
A/D	lb.	...	.15¼	...	.15¼	.13⅞	.14½
A/E	lb.	...	.12⅞	...	.12⅞	.12⅞	.13⅜
E	lb.	...	.10	...	.10	.10	.10⅜
F	lb.	...	.08	...	.08	.08	.08¾
Singapore, No. 1	lb.	...	.16⅝	...	.16⅝	.16⅝	.19⅝
No. 2	lb.	...	.12¼	...	.12¼	.12¼	.15¾
No. 3	lb.	...	.07⅛	...	.07⅛	.07⅛	.09
Chips	lb.	...	.11	...	.11	.11	.12½
Dust	lb.	...	07⅛	...	.07⅛	.07⅛	.09
Seeds	lb.	...	.09⅞	...	.09⅞	.09⅞	.10½
Elemi, cns, c-l	lb.	...	.08½	...	.08½	.10⅛	.11⅝
Ester	lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
Gamboge, pipe, cases	lb.	.95	1.00	.95	1.00	.70	.75
Powd, bbls	lb.	1.05	1.10	1.05	1.10	.75	.80
Ghatti, sol, bgs	lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs	lb.	.14	.33	.14	.33	.14	.33
Kauri, NY							
Brown XXX, cases	lb.	...	.60	...	.60	...	.60
BX	lb.	...	.38	...	.38	...	.38
B1	lb.	...	.28	...	.28	...	.28
B2	lb.	...	.24	...	.24	...	.24
B3	lb.	...	.18½	...	.18½	...	.18½
Pale XXX	lb.	...	.61	...	.61	...	.61
No. 1	lb.	...	.41	...	.41	...	.41
No. 2	lb.	...	.24	...	.24	...	.24
No. 3	lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins	lb.	no prices		no prices		2.00	4.50
Mastic	lb.	1.50	1.65	1.50	1.65	.85	2.50
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	.52½	.55	.50	.55	.35	.37
Senegal, picked bags	lb.	...	.30	...	.30	...	.30
Sorts	lb.	...	.13	...	.13	...	13
Thus, bbls 280	lbs.	15.00	15.25	15.00	15.25	15.00	15.25
Tragacanth, No. 1, cases	lb.	3.00	3.10	2.75	3.10	2.65	3.50
No. 2	lb.	2.70	2.80	2.45	2.80	2.55	3.35
No. 3	lb.	2.50	2.60	2.10	2.60	2.45	2.90
Yacca, bgs	lb.	.03½	.04	.03½	.04	.03½	.04
Hematine crystals, 400 lb bbls	lb.	.20	.30	.20	.30	.20	.30
Hemlock, 25%, 600 lb bbls.							
wks	lb.	...	.03⅛	...	.03⅛	.03⅛	.03⅜
tks	lb.	...	.02¾	...	.02¾	.02¾	.03
Hexalene, 50 gal drs, wks	lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70° C. Group 3, tks	gal.	...	.09¾	...	.09¾	...	.10½
Hexamethylenetetramine, powd, drs	lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13	.13½
tks	lb.	...	.12		.12		.12
Hoof Meal, f.o.b. Chicago	unit	2.70	2.75	2.65	2.80	2.00	3.15
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.16	.18½	.16	.18½	.16½	.20

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Hydroxylamine Hydrochloride ... lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	...	14	...	.14		.14
Indigo, Bengal, bbls ... lb.	1.63	1.67	1.63	1.67	1.63	1.67
Synthetic, liquid ... lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars .. lb.	...	2.00	...	2.00	1.75	2.50
Irish Moss, ord, bales ... lb.	.25	.28	.25	.28	.15	.28
Bleached, prime, bales ... lb.	.32	.35	.32	.35	.28	.35
Iron Acetate Liq. 17°, bbls delv ... lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls .. 100 lb.	3.50	4.00	3.50	4.00	2.75	4.00
Isobutyl Carbinol (128-132° C)						
drs, frt all'd ... lb.	...	.23½	.22½	.23½	.22½	.34
tks, frt all'd ... lb.	...	.21½	...	.21½	.21½	.32
Isopropyl Acetate, tks, frt all'd ... lb.	...	.07½	.06½	.07½	.05½	.06½
drs, frt all'd, c-l ... lb.	...	.08½	.07½	.08½	.06½	.07½
Ether, see Ether, isopropyl.						
Keiselguhr, dom bags, c-l, Pacific Coast ... ton	22.00	25.00	22.00	25.00	22.00	35.00
Lead Acetate, f.o.b. NY, bbls,						
White, broken ... lb.	.12	.12½	.11	.12½	...	.11
cryst, bbls ... lb.	.12	.12½	.11	.12½	...	.11
gran bbls ... lb.	.12¾	.13¼	.11¾	.13¼	...	.11¾
powd, bbls ... lb.	.12¾	.13¼	.11¾	.13¼	...	.11¾
Arsenate, East, drs ... lb.	.09	.09½	.09	.09½	.08½	.11
Linoleate, solid, bbls ... lb.	...	.19	...	.19		.19
Metal, c-l, NY ... 100 lb.	...	5.70	...	5.70	4.90	5.70
Nitrate, 500 lb bbls, wks lb.	.11	14	.11	.14	.11	.14
Oleate, bbls ... lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv ... lb.	...	.08¾	.08	.08¾	.07½	.0815
97% Pb_3O_4, delv ... lb.	...	.086	.084	.086	.0765	.0848
98% Pb_3O_4, delv ... lb.	.0885	.0865	.0865	0885	.08	.0865
Resinate, precip, bbls ... lb.	...	.16½	...	.16½	...	.16½
Stearate, bbls ... lb.	...	.25	...	.25	...	.26
Titanate, bbls, c-l, f.o.b. wks, frt all'd ... lb.	...	.10¼	...	.10¼	.10	.10¼
White, 500 lb bbls, wks, lb.	...	.07½	...	.07½	.07	.07½
Basic sulfate, 500 lb bbls, wks ... lb.	...	.06½	...	.06½	.06¼	.06½
Lime, chemical quicklime, f.o.b. wks, bulk ... ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks ... ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks gal.	...	.07½	...	.07½	.07½	.11½
drs ... gal.	.10	.14	.10	.14	.11	.16
Linseed Meal, bgs ... ton	23.00	23.50	23.00	25.00	23.50	37.00
Litharge, coml, delv, bbls lb.	...	.0760	.07	.0760	.06½	.07½
Lithopone, dom, ordinary, delv, bgs ... lb.	...	.0385	...	.0385	...	.036
bbls ... lb.	...	.0410	...	.0410	.03¾	.03¾
Titanated, bgs ... lb.	...	.05¼	...	.05¼	...	.05¼
bbls ... lb.	...	.05½	...	.05½	...	.05½
Logwood, 51°, 600 lb bbls lb.	...	.13	.10½	.13	.10½	.12½
Solid, 50 lb boxes ... lb.	...	.22	.16½	.22	.16½	.20½
Madder, Dutch ... lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls ton	67.00	75.00	65.00	75.00	58.00	70.00
Magnesium Carb, tech, 70 lb bgs, wks ... lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ... ton	...	32.00	...	32.00	32.00	42.00
Fluosilicate, crys, 400 lb bbls, wks ... lb.	.11	.11¼	.10	.11¼	.10	.10½
Oxide, calc tech, heavy bbls, frt all'd ... lb.	...	.26	...	.26	.25	.30
Light bbls above basis lb.	...	.26	...	.26	.20	.26
USP Heavy, bbls, above basis ... lb.	...	.26	...	.26	.25	.30
Palmitate, bbls ... lb.	.33	nom.	.33	nom.	.33	nom.
Silicofluoride, bbls ... lb.	.11	.11¼	.11	.11½	.11	.11½
Stearate, bbls ... lb.	...	.28	.23	.28	.23	.27
Manganese, acetate, drs .. lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	16	.15	.16	.15	.16
Chloride, bbls ... lb.	...	.14	...	...	...	...
Dioxide, tech (peroxide), paper bgs, c-l ... ton	...	71.50	...	71.50	62.50	70.00
Hydrate, bbls ... lb.	...	.82	...	.82	...	.82
Linoleate, liq, drs ... lb.	.18	.19½	.18	.19½	.18	.19½
solid, precip, bbls ... lb.	...	19	...	.19	...	.19
Resinate, fused, bbls ... lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs ... lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs ... lb.	.10½	.10¾	.10½	.10¾	.08	.09¾
Mangrove, 55%, 400 lb bbls lb.						
Bark, African ... ton	36.00	nom.	34.00	36.00	30.00	39.50
Mannitol, pure cryst, cs, wks lb.	...	.85	.85	.90	.90	1.00
commercial grd, 250 lb bbls ... lb.	.35	.40	.35	.45	.38	.50
Marble Flour, blk ... ton	12.00	14.00	12.00	14.00	12.00	14.00
Mercury chloride (Calomel) lb.	...	2.70	...	2.70	2.45	2.95
Mercury metal .. 76 lb. flasks	186.00	188.00	167.00	185.00	163.00	228.50
Mesityl Oxide, f.o.b. dest., tks ... lb.	...	.10½	.10½	.15	...	.15
drs, c-l ... lb.	...	.11½	.11½	.16	.	.16
drs, lcl ... lb.	...	.12	.12	.16½	...	.16½
Meta-nitro-aniline ... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ... lb.	1.05	1.10	1.05	1.10	1.05	1.40
Meta-phenylene diamine 300 lb bbls ... lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ... lb.	...	.65	...	.65	.65	.67
Methanol, denat, grd, drs, c-l frt all'd ... gal.	...	.45	...	.45	...	.45
tks, frt all'd ... gal.	...	.40	...	.40	...	.40

Current

Methanol, Pure
Orthonitrochlorobenzene

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Methanol (continued):						
Pure, drs, c-l, frt all'd gal.	...	.35½	...	.35½	.35	.38
tks ....gal.	...	.30	...	.30	.30	.33
95%, tks ....gal.	...	.29	...	.29	.28	.31
97%, tks ....gal.	...	.30	...	.30	.29	.32
Methyl Acetate, tech tks,						
delv ....lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv ......lb.	.07	.08	.07	.08	.07	.08
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv .....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Acetone, frt all'd, drs gal. *p*	...	.55½	.37½	.55½	.41	.44
tks, frt all'd ......gal. *p*	...	.50	.32	.50	.35	.39
Synthetic, frt all'd,						
east of Rocky M.,						
drs ....gal. *p*	...	.51	.37½	.51	.36	.44
tks, frt all'd ...gal.	...	.43	.32	.43	.32	.36
West of Rocky M.,						
frt all'd, drs...gal *p*	...	.53½	.41½	.53½	.41½	.48
tks, frt all'd ..gal. *p*	...	.45½	.35	.45½	.35	.45½
Anthraquinone ....lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ......lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb lots,						
frt all'd ....lb.	...	.55	...	.55	.55	.70
less than 100 lbs. f.o.b.						
wks ....lb.	...	.60	...	.60	.60	.75
Chloride, 90 lb. cyl ....lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.07½	.06	.07½	.05½	.06
50 gal drs, frt all'd, c-l lb.	...	.08½	.07	.08½	.06½	.07½
Formate, drs, frt all'd ..lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd ..lb.	...	.80	...	.80	...	.80
Mica, dry grd, bgs, wks..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes						
mixed, ref., l-c-l, drs, f.o.b.						
wks ....lb.	...	.16	.16	.19	...	...
crude ....lb.	...	.14	.14	.15	...	...
Monoamylamine, c-l, drs, wks lb.	...	.50	.50	.52	...	.52
lcl, drs, wks ....lb.	...	.53	...	.55	...	.55
Monoamylnaphthalene, l-c-l,						
drs, f.o.b. wks ....lb.	...	.17	.17	.20	...	...
Monobutylamine, drs,						
c-l, wks ....lb.	...	.50	...	.50	...	.50
lcl, wks ....lb.	...	.40	...	.53	...	.53
tks, wks ....lb.	...	.48	...	.48	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis)						
lcl, drs, f.o.b. wks .....lb.	...	.35	.35	.65	...	.65
Monomethylamine, drs, frt						
all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate,						
100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal,						
wks ....lb.	...	.67	...	.67	...	.75
Myrobalans 25%, liq bbls lb.	no prices		no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices		no prices		no prices	
J1 bgs ....ton	no prices		35.00	48.00	28.50	40.00
J2 bgs ....ton	no prices		28.00	39.00	23.00	34.00
Naphtha, v.m.&p. (deodorized)						
see petroleum solvents.						
Naphtha, Solvent, water-						
white, tks ....gal.	...	26	...	.26	.26	.27
drs, c-l ....gal.	...	.31	...	.31	.31	.32
Naphthalene, dom, crude bgs,						
wks .... lb. *q*	2.25	2.50	2.25	2.50	2.25	2.75
imported, cif, bgs ....lb.	no prices		no prices		...	3.00
Balls, flakes, pks ......lb.	.06¼	.07¾	.06¼	.07¾	.06¼	.07¾
Balls, ref'd bbls, wks.. lb.	..	.07	...	.07	.06¾	.07
Flakes, re'd, bbls, wks lb.		.07	...	.07	.06¾	.07
Nickel Carbonate, bbls ...lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls ....lb.	.18	20	.18	.20	.18	.20
Metal ingot ....lb.	.35	.36	.34	.36	.34	.35
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs,						
55 lb drs .... lb.	...	.703	...	.703	...	.70
Nitre Cake, blk .... ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000						
lb drs, wks ....lb.	.08	.09	.08	.09	.08	.10
tks ....lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon,						
f.o.b. Atlantic & Gulf ports,						
tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		2.20	2.60
dom, Eastern wks ....unit	...	2.20	...	2.20	2.20	2.90
dom, Western wks ....unit	...	2.00	1.75	2.00	1.95	2.00
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs ....lb.	.26	.29	.26	.29	.28	.30
Oak Bark Extract, 25%, bbls lb.	.03⅛	03⅛	.03⅛	.03⅛	.03⅛	.03⅛
tks ....lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks ..lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks						
NY ....lb.	...	.11½	.11	.11½	.10½	.13½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs,						
f.o.b. wks ....lb.	...	.15	...	.15	...	...
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	.70	.74
Orthochlorophenol, drs ...lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.16	.16½	.16	.16½	.16	.16½
Orthodichlorobenzene, 1000						
lb drs ....lb.	...	.07	.06	.07	.06	.07
Orthonitrochlorobenzene, 1200						
lb drs, wks ....lb.	.15	.18	.15	.18	.15	.18

a Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Orthonitroparachlorphenol, tins ....lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs ....lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks ....lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl ....lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.21	...	.21	...	.21
51° liquid ....lb.	...	.10	...	.10	...	.10
Paraffin, rfd, 200 lb bgs						
122-127° M P ....lb.	...	.057	...	.057	.02¼	.0675
128-132° M P ....lb.	.057	.0595	.057	.0595	.057	.0705
133-137° M P ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.0755
Para aldehyde, 99%, tech, 110-55 gal drs, wks ..lb.	.10	.11¼	.10	.11¼	.10	.11¼
Aminoacetanilid, 100 lb kgs ....lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs ....lb.	...	.32	...	.32	...	.32
Dichlorobenzene 200 lb drs, wks ....lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks lb.	.23	.24	.23	.24	.34	.35
Nitroacetanilid, 300 lb bbls ....lb	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ....lb.	...	.45	...	.45	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks ....lb.	...	.15	...	.15	.15	.16
Nitro-orthotoluidine, 300 lb bbls ....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	.35	.37
Nitrosodimethylaniline, 120 lb bbls ....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Phenylenediamine, 350 lb bbls ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls ....lb.	...	.70	...	.70	.70	.75
tks, wks ....lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ....lb.	...	.48	...	.48	.48	.50
Paris Green, dealers, drs lb.	.23	.25	.23	.25	.23	.26
Pentane, normal, 28-38° C, group, 3 tks ....gal.	...	.08½	...	.08½	...	.08½
drs, group 3 ....gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs, frt all'd ....lb.	.08	.08½	.08	.08½	.08	.08¼
Petrolatum, dark amber, bbls ....lb.	...	.03¼	.02¾	.03¼	.02¾	.05
White, lily, bbls ....lb.	...	.04¾	...	.04¾	.04¾	.08½
White, snow, bbls ....lb.	...	.05½	...	.05½	.05½	.09½
Petroleum Ether, 30-60°, group 3, tks ....gal.	...	.13½	...	.13½	...	.13½
drs, group 3 ....gal.	...	.14½	...	.14½	.14½	.25½

PETROLEUM SOLVENTS AND DILUENTS

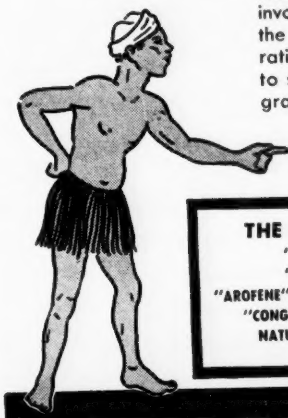
	Current Market		1941 Low	1941 High	1940 Low	1940 High
Cleaners naphthas, group 3, tks ,wks ....gal.	.06¾	...	.06¾	.07	.06⅞	.07
East Coast, tks, wks gal.	.09½	...	.09	.10½	.09	.10½
Lacquer diluents, tks						
East Coast ....gal.	...	.10	.09½	.10	.09½	.10
Group 3, tks ....gal.	.06⅝	.07¾	.06¼	.07¾	.07⅜	.07⅞
Naphtha, V.M.P., East tks, wks ....gal.	.09½	...	.09	.09½	.09½	.10
Group 3, tks, wks ...gal.	.06¾	...	.06	.07	.06⅜	.07⅞
Petroleum thinner, 43-47, East, tks, wks ....gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks ..gal.	.06	.07	.05⅞	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks ..gal.	...	.09½	...	.09½	.09½	.10
Group 3, tks, wks ..gal.	.06	.07	.06	.07	.06⅜	.07⅞
Stoddard Solvents, East, tks, wks ....gal.	.083	.09½	.083	.09½	.08¾	.09½
Group 3, wks ....gal.	.05½	.06½	.05½	.06½	.06⅜	.06½
Phenol, 250-100 lb drs ....lb.	.12½	...	.12	.13¾	.12	.14¾
tks, wks ....lb.	...	.11½	.11	.11½	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs ....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs ....lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com ....lb.	...	1.50	...	1.50	...	1.50
Phloroglucinol, tech, tins lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons ....lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines						
70% basis ....ton	...	2.15	...	2.15	1.85	1.90
72% basis ....ton	...	2.50	...	2.50	2.15	2.35
Florida Pebble, 68% basis ton	...	1.90	...	1.90	1.90	2.85
75-74% basis ....ton	...	2.90	...	2.90	2.90	3.85
Tennessee, 72% basis ..ton	...	4.50	...	4.50	...	4.50
Phosphorus Oxychloride 175 lb cyl ....lb.	.15	.18	.15	.18	.15	.20
Red, 110 lb cases ....lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs ..lb.	.38	.42	.38	.42	.38	.44
Trichloride, cyl ....lb.	.15	.16	.15	.16	.15	.18
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, ,100 lb drs, wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	.50	.55	.50	.55	.53	.56
Steam dist wat wh bbls gal.	...	.59	...	.59	...	.59
tks ....gal.	...	.54	...	.54	...	.54
Pitch Hardwood, wks ...ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ....ton	19.00	22.00	19.00	22.00	...	19.00

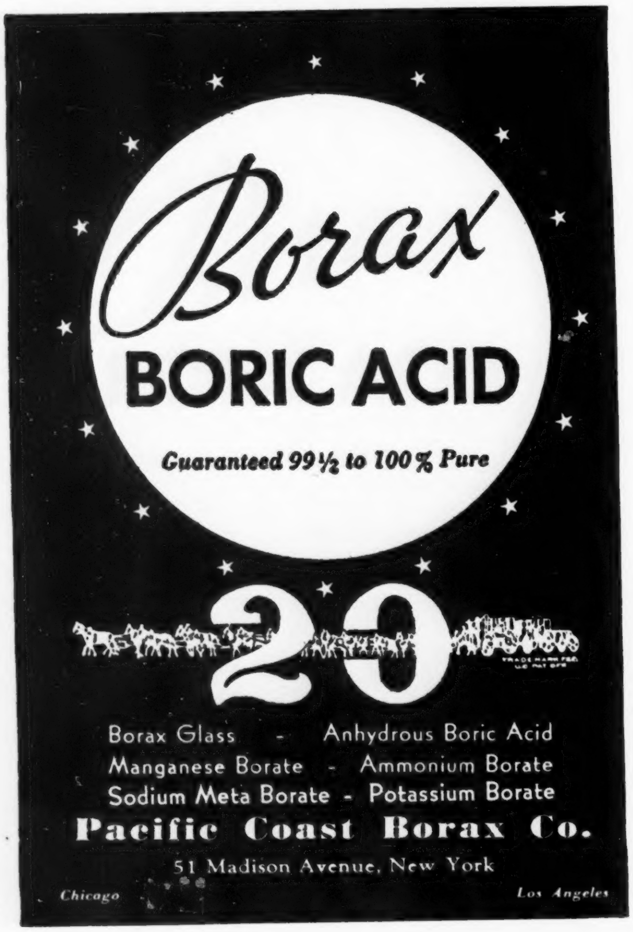
Current

Pitch, Burgundy
Rosins

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Pitch (continued)						
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.05½	06½
Imported ....lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls .... bbl.	6.00	6.50	6.00	6.50	6.00	6.50
Polyamylnaphthalene, l-c-l, drs, f.o.b. wks ....lb.	...	.25	.25	.30	...	...
Potash, Caustic, wks, sol ..lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake ....lb.	...	.07	...	.07	.07	.07½
liquid, tks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.03¾
Manure Salts, Dom 30% basis, blk .....unit	...	.60	...	.60	.53½	.58½
Potassium Abietate, bbls ..lb.	...	.08	...	.08	.08	.09
Acetate, tech, bbls, delv lb.	...	.26	...	.26	...	.26
Bicarbonate, USP, 320 lb bbls ....lb.	...	.15	.15	.17	...	.18
Bichromate Crystals, 725 lb cks* ....lb.	.09⅝	...	.08⅞	.09⅝	.08¾	.09¼
Binoxalate, 30 lb bbls ..lb.	...	.23	...	.23		.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks ....lb.	.06½	.06¾	.06½	.06¾	.06½	.07
liquid, tks ....lb.	...	.0275	...	.0275	.0275	.03
drs, wks ....lb.	.03	.03⅛	.03	.03⅛	.03	.03½
Chlorate crys, 112 lb kgs, wks ....lb.	nom.	.11	...	.11	.10½	.13
gran, kgs ....lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs ....lb.	.09½	.10	.09½	.10	.10	.12½
Chloride, crys, bbls ....lb.	.08	nom.	.04	.08	.04	.04¾
Chromate, kgs ....lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs ....lb.	...	.55	...	.55	.55	.75
Iodide, 250 lb bbls .....lb.	1.35	1.38	1.35	1.38	...	1.35
Metabisulfite, 300 lb bbls lb.	nom.	.21	nom.	.21	.13	.19
Muriate, bgs, dom, blk unit	...	.58	.53½	.58	...	.53½
Oxalate, bbls ....lb.	.28	.30	.25	.30	.25	.26
Perchlorate, kgs, wks ..lb.	.09½	.11	.09½	.11	.09½	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.20½	.21	.19¼	.21	.18½	.20½
Prussiate, red, bbls ....lb.	no prices		no prices		.38	.45
Yellow, bbls ....lb.	.17	.19	.16	.19	.15	.18
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	34.25	36.25
Titanium Oxalate, 200 lb bbls ....lb.	...	.40	...	.40	.40	.45
Pot & Mag Sulfate, 48% basis bgs ....ton	...	27.00	...	27.00	24.75	27.00
Propane, group 3, tks ....lb.	.03¾	.04	.03¾	.04	.03	.04⅜
Putty, com'l, tubs ....100 lb.	...	3.15	...	3.15	...	6.00
Linseed Oil, kgs ....100 lb.	...	5.00	...	5.00	...	4.50
Pyrethrum, conc liq:						
2.4% pyrethrins, drs, frt all'd ....gal.	4.75	4.95	4.75	4.95	4.75	7.50
3.6% pyrethrins, drs, frt all'd ....gal.	...	7.20	...	7.20	7.20	11.00
Flowers, coarse, Japan, bgs ....lb.	.23	.25	.23	.25	.23	.36
Fine powd, bbls ......lb.	.25	.26	.25	.26	.25	.37
Pyridine, denat, 50 gal drs gal.	...	1.71	...	1.71	...	1.71
Refined, drs ....lb.	...	.48	...	.48	...	.51
Pyrites, Spanish cif Atlantic ports, blk ....unit	no prices		no prices		.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.40
Quebracho, 35% liq tks ..lb.	...	.03¾	...	.03¾	.03¼	.03¾
450 lb bbls, c-l ......lb.	...	.04¼	...	.04¼	.04	.04¼
Solid, 63%, 100 lb bales cif ....lb.	...	.04⅞	...	.04⅞	.04½	.04⅞
Clarified, 64% bales ..lb.	...	.05⅛	...	.05⅛	.04¾	.05⅛
Quercitron, 51 deg liq, 450 lb. bbls ....lb.	.08½	.09½	.08½	.09½	.08½	.09½
Solid, drs ....lb.	.11	.16½	.11	.16½	.10	.16½
R Salt, 250 lb bbls, wks lb.	...	.55	...	.55	...	.55
Resorcinol, tech, cans ....lb.	.68	.74	.68	.74	.75	.80
Rochelle Salt, cryst ......lb.	.39½	...	.32½	.39½	.22¼	.29¾
Powd, bbls ....lb.	.38½	...	.31½	.38½	.21¾	.28¾
Rosin Oil, bbls, first run gal.	...	.40	.40	.50	...	.50
Second run ....gal.	...	.42	.42	.56	.52	.56
Third run, drs ....gal.	...	.46	.46	.57	.56	.57
Resins 600 lb bbls, 100 lb unit ex. yard NY:**						
B	...	2.37	2.06	2.37	1.80	2.45
D	...	2.48	2.08	2.48	1.87	2.48
E	...	2.48	2.07	2.48	1.95	2.51
F	...	2.51	2.08	2.51	2.10	2.51
G	...	2.51	2.18	2.51	2.10	2.48
H	...	2.51	2.27	2.51	2.10	2.48
I	...	2.51	2.26	2.51	2.10	2.54
K	...	2.56	2.36	2.65	2.12	2.75
M	...	2.62	2.38	2.65	2.20	2.81
N	...	2.73	2.47	2.81	2.39	2.85
WG	...	2.88	2.79	3.11	2.68	3.17
WW	...	3.09	3.05	3.31	3.00	3.40
X	...	3.09	3.10	3.31	...	...
Rosins, Gum, Savannah (280 lb. unit):**						
B	...	1.56	1.31	1.56	1.15	1.80
D	...	1.65	1.51	1.65	1.22	1.83
E	...	1.67	1.60	1.67	1.30	1.86
F	...	1.67	1.62	1.67	1.45	1.86
G	...	1.67	1.62	1.67	1.45	1.83
H	...	1.68	1.63	1.68	1.45	1.83
I	...	1.71	...	1.71	1.45	1.89
K	...	1.90	1.84	1.90	1.47	2.10
M	...	2.01	2.01	2.10	1.55	2.16

* Spot price is ⅛c higher. ** Jan. 24, 1941, high and low based on 280 lb. unit.





Prices

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Rosins (continued):						
N	...	2.47	...	2.47	1.70	2.20
WG	...	2.95	...	2.95	2.03	2.52
WW	...	3.25	...	3.25	2.25	2.75
X	...	3.25	...	3.25	2.35	2.75
Rosin, Wood, c-l, FF grade, NY	1.70	2.00	1.40	2.00	1.40	1.54
Rotten Stone, bgs mines ton	25.50	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ... lb.	no prices		no prices		...	.14
Powdered, bbls ...... lb.	no prices		no prices		.08½	.10
Sago Flour, 150 lb bgs .. lb.	.04½	.05	.03½	.05	.04	.04½
Sal Soda, bbls wks ... 100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ...... ton	...	17.00	...	17.00	...	17.00
Chrome, c-l, wks ...... ton	...	16.00	...	16.00	11.00	16.00
Saltpetre, gran, 450-500 lb bbls ...... lb.	...	.081	.076	.081	.071	.08
Cryst, bbls ...... lb.	...	.091	.086	.091	.081	.08¾
Powd, bbls ...... lb.	...	.091	.086	.091	.081	.10
Satin, White, pulp, 550 lb bbls ...... lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs ..... lb.	...	46	...	.46	.46	.48
Shellac, Bone dry, bbls .. lb. s	...	.35	.26	.35	.23	.27
Garnet, bgs ...... lb.	.30	.31	.20	.31	.18½	.23
Superfine, bgs ...... lb. s	.29	.30	.16½	.30	.14½	.20½
T. N., bgs ...... lb. s	.28	.29	.16	.29	.13½	.19½
Silver Nitrate, vials ..... oz.	...	.24	.24	.26⅞	.26¾	.27⅜
Slate Flour, bgs, wks .... ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ...... 100 lb.	...	1.10	...	1.10	...	1.10
58% light, bgs ..... 100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
blk ...... 100 lb.	...	.90	...	.90	...	.90
paper bgs ...... 100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls ...... 100 lb.	...	1.35	1.35	1.45	1.35	1.45
Caustic, 76% grnd & flake, drs ...... 100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs ..... 100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks .. 100 lb.	...	2.00	...	2.00	1.95	1.97½
SODIUM						
Sodium Abietate, drs ..... lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran, powd, flake, 450 lb bbls wks ...... lb.	.04¼	.05	.04	.05	.04	.05
90%, bbls, 275 lb delv lb.	.06	.06½	.06	.06¾	.06	.06¾
anhyd, drs, delv ..... lb.	.08¼	.10	.08¼	.10	.08¼	.10
Alginate, drs ...... lb.	.39	.70	.39	.70	.39	.96
Antimoniate, bbls ...... lb.	.15	.15½	.14	.15½	.14½	.15
Arsenate, drs ...... lb.	.07½	...	.07	.08¾	.07	.08¾
Arsenite, liq, drs ..... gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks .. lb.	.06¼	.06¼	.06½	.09¼	.06½	.09½
Benzoate, USP kgs .... lb.	.46	.50	.46	.50	.46	.52
Bicarb, powd, 400 lb bbl, wks ...... 100 lb.	...	1.70	...	1.70	1.70	1.85
Bichromate, 500 lb cks, wks* ...... lb.	...	.07⅜	.06⅞	.07½	.06¼	.07¼
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.30	1.80
Chlorate, bgs, wks ..... lb.	...	.06¼	...	.06¼	.06¼	.08½
Cyanide, 96-98%, 100 & 250 lb drs, wks ...... lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv ...... lb.	...	.09	...	.09	.08½	.09
Fluoride, white 90%, 300 lb bbls, wks ...... lb.	.07	.08	.07	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks ...... lb.	.17	.18	.17	.18	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	...	2.80	...	2.80	2.80	3.05
Tech, reg cryst, 375 lb bbls, wks ...... 100 lb.	2.45	...	2.45	...	2.45	2.80
Iodide, jars ...... lb.	...	2.42	...	2.42	2.30	2.42
Metanilate, 150 lb bbls .. lb.	.41	nom.	.41	nom.	.41	.42
Metasilicate, gran, c-l, wks ...... 100 lb.	...	2.35	...	2.35	...	2.35
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, cl, drs ...... 100 lb.	...	3.75	...	3.75	3.75	3.75
wks, lcl, drs, .. 100 lb.	5.05	5.05	5.05	5.05	5.05	5.05
Monohydrated, bbls .... lb.	.023	.026	.023	.026	..	.023
Naphthenate, drs ...... lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY ...... ton	...	28.70	...	28.70	...	28.30
100 bgs, same basis .. ton	...	29.40	...	29.40	...	29.00
Bulk ...... ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls .... lb.	.06¾	...	.06¾	.11½	.06¾	.11½
Othochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l ...... lb.	...	.03	...	.03	...	.03
Perborate, drs, 400 lb .. lb.	.14¾	...	.14¾	.15¼	.14¾	.15¼
Peroxide, bbls, 400 lb .. lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.40	2.30	2.40	...	2.30
bgs, wks ...... 100 lb.	...	2.20	2.10	2.20	...	2.10
Tri-sodium, tech, 325 lb bbls, wks ...... 100 lb.	...	2.55	2.45	2.55	...	2.45
bgs, wks ...... 100 lb.	...	2.35	2.25	2.35	...	2.25
Picramate, 160 lb kgs .. lb.	...	.65	...	.65	.65	.67
Prussiate, Yellow, 350 lb bbls, wks ...... lb.	.10½	...	.10½	.10¾	.09½	.10¾
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	...	.0510	.0510	.0515	...	.0530

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

Current

**Sodium Sesquisilicate
Titanium Calcium Pigment**

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Sodium (continued):						
Sesquisilicate, drs, c-l, wks ....100 lb.	...	2.90	...	2.90	2.00	2.90
Silicate, 60°, 55 gal drs, wks ....100 lb.	no prices		1.40	1.80	1.40	1.80
40°, 55 gal drs, wks 100 lb	...	.80	...	.80	...	.80
tks, wks ....100 lb.	no prices		...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.10	.12	.09¾	.12	...	...
Stannate, 100 lb drs ....lb.	.33½	.36½	.32½	.37	.31½	.35½
Stearate, bbls ....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks ....100 lb. †	1.70	1.90	1.45	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, wks ....lb.	.02¼	...	.02¼	.03	.02¼	.03
Solid, 650 lb drs, c-l, wks ....lb.	.03	...	.03	.03¾	.03	.03¾
Sulfite, powd, 400 lb bbls wks ....lb.	...	.05¼	...	.05¼	.023	.05¼
Sulfocyanide, drs ....lb.	.28	.47	.28	.47	.28	.47
Sulforicinoleate, bbls ....lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		no prices	
Sorbitol, com, solut, wks c-l, drs, wks ....lb.	...	.14¾	...	.14¾	.14¾	.16
Spruce, Extract, ord, tks ....lb.	...	.01⅛	...	.01⅛	...	.01⅛
Ordinary, bbls ....lb.	...	.01⅝	...	.01⅝	...	.01⅝
Super spruce ext, tks ....lb.	...	.01⅜	...	.01⅜	...	.01⅜
Super spruce ext, bbls ....lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	...	3.10	2.90	3.10	2.50	2.95
Powd, 140 lb bgs ....100 lb.	...	3.80	3.05	3.80	2.60	3.05
Potato, 200 lb bgs ....lb.	.05	...	.04½	.05½	.05	.07½
Imp, bgs ....lb.	no prices		no prices		...	.06½
Rice, 200 lb bbls ....lb.	.07½	.08½	.07½	.08½	.07¼	.08½
Sweet Potato, 240 lb bbls, f.o.b. plant ....100 lb.	nom.	7.00	nom.	7.00	5.50	7.00
Wheat, thick, bgs ....lb.	...	.05	...	.05	.05¼	.05½
Strontium, carbonate, 600 lb bbls, wks ....lb.	no prices		no prices		.22	.23
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks ....lb.	...	.45	...	.45	...	.45
tech, bbls, wks ....lb.	...	.40	...	.40	...	.40
SULFUR						
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs ....100 lb.	1.40	1.95	1.40	1.95	1.40	2.35
bbls ....100 lb.	1.95	2.50	1.95	2.50	1.95	2.70
Rubbermakers, bgs ....100 lb.	...	2.00	...	2.00	2.00	2.80
bbls ....100 lb.	...	2.35	...	2.35	2.35	3.15
Extra fine, bgs ....100 lb.	...	2.35	...	2.35	2.85	3.00
Superfine, bgs ....100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	2.80	3.35	2.80	3.35	2.80	3.75
bbls ....100 lb.	3.15	3.70	3.15	3.70	3.15	4.10
Roll, bgs ....100 lb.	2.15	2.70	2.15	2.70	2.15	3.10
bbls ....100 lb.	2.30	2.85	2.30	2.85	2.50	3.25
Sulfur Chloride, 700 lb drs, wks ....lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks ....lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks ....lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks lb.	.16	.40	.16	.40	.16	.40
Mutiple units, wks ....lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ....ton	no prices		no prices		98.00	140.00
Extract, 42°, bbls ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
Superphosphate, 16% bulk, wks ....ton	...	10.00	8.50	10.00	8.50	9.00
Run of pile ....ton	...	9.50	8.00	9.50	8.00	8.50
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit ....ton	...	.68	..	.68	.68	.70
Talc, Crude, 100 lb bgs, NY ton	14.00	16.00	14.00	16.00	14.00	15.00
Ref'd 100 lb bgs, NY ton	17.25	19.25	17.25	19.25	14.00	17.25
French, 220 lb bgs, NY ton	no prices		no prices		23.00	35.00
Ref'd, white bgs, NY ton	no prices		no prices		45.00	60.00
Italian, 220 lb bgs to arr ton	no prices		no prices		64.00	70.00
Ref'd, white bgs,, NY ton	no prices		no prices		65.00	78.00
Tankage, Grd, NY ....unit u	...	3.35	2.35	3.35	2.35	3.25
Ungrd ....unit u	...	3.60	2.35	3.60	2.35	3.25
Fert grade, f.o.b. Chgo unit u	...	4.10	2.35	4.10	2,40	3.50
South American cif unit u	nom.	3.00	2.60	3.00	2.50	3.50
Tapioca Flour, high grade, bgs ....lb.	.04¼	.06	.03	.06	.02¾	.05
Tar Acid Oil, 15%, drs ....gal.	.22	.24	.22	.24	.22	.24
25% drs ....gal.	.25	.27	.25	.27	.25	.28
Tar, pine, delv, drs ....gal.	.26	.27	.26	.27	.26	.27
tks, delv, E. cities ....gal.	...	.21	...	.21	...	.21
Tartar Emetic, tech, bbls lb.	...	.44¾	.36¾	.44¾	.34¾	.36¾
USP, bbls ....lb.	...	.50	.42	.50	.40	.42
Terpineol, den grade, drs lb.	...	.17	...	.17	..	.17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09	.08	.09½
Tetralene 50 gal drs, wks lb.	...	.19	...	.19	.12	.18
Thiocarbanilid, 170 lb bbls lb.	...	.24	...	.24	.20	.25
Tin, crystals, 500 lb. bbls, wks lb.	.39½	.40	.38	.40	.36	.40½
Metal, NY ....lb. *	...	.52¾	.501	.52¾	.45½	.55
Oxide, bbls, wks lb.	.55	.57	.54	.56	.51	.56
Tetrachloride, 100 lb drs, wks ....lb.	...	.29	.25¼	.28½	.23	.26½
Titanium Dioxide, 300 lb bbls lb.	...	.14¾	.13¾	.14¾	.13	.16
Barium Pigment, bbls ....lb.	.05¾	.06½	.05¾	.06½	.05¼	.06½
Calcium Pigment, bbls lb.	.05½	.05¾	.05½	.05¾	.05	.06¼

† Bags 15c lower; u + 10; * June 30.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Titanium tetrachloride, drs, f.o.b. Niagara Falls ....lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls .....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks ....lb.	...	.26	...	.26	.26	.27
Toluol, 110 gal drs, wks gal.	...	.32	...	.32	.27	.32
8000 gal tks, frt all'd gal.	...	.27	...	.27	.22	.27
Toner Lithol, red, bbls ...lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls ....lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs ....lb.	...	1.05	...	1.05	1.05	1.35
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks, lb.	...	.27	...	.27	...	.27
Triamylamine, drs, lcl, wks, drs ....lb.	...	.90	...	.90	.78	.90
Tributylamine, lcl, drs, f.o.b. wks ....lb.	...	.70	...	.70	.67	.70
Tributyl citrate, drs, frt all'd lb.	.24	...	.24	.26	.24	.35
Tributyl Phosphate, frt all'd lb.	...	.42	...	.42	...	.42
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	.08	...	.08	.09	.08	.09
Tricresyl phosphate, tech, drs lb.	.25	...	.22	.36½	.22	.36½
Triethanolamine, 50 gal drs, wks ....lb.	...	.19	...	.19	.19	.22
tks, wks ....lb.	...	.18	...	.18	.18	.20
Triethylamine, lcl, drs, f.o.b. wks .... lb.	...	1.05	...	1.05	...	1.05
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls .... lb.	...	.30	...	.30	...	.30
Stearate bbls ....lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest ....lb.	...	.50	...	.50	...	.50
Trimethylamine, c-l, drs, frt all'd E. Mississippi ... lb.	..	.90	.90	1.00	...	1.00
Triphenylguanidine ....lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs . lb.	...	.38	...	.38	...	.38
Tripoli, airfloated, bgs, wks ton	...	26.00	...	26.00	26.00	30.00
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.52	.45	.52	.32½	.40
Savannah, bbls ....gal.	...	.38¼*	.33½	.38¼	.26½	.34
Wood Steam dist, drs, c--lcl, NY ....gal.	.47	...	.35	.40	.27	.34½
Wood, dest dist, cl-lcl, drs, delv E. cities ....gal.	...	.36*	.35	.36	.25	.32
Urea, pure 112 lb cases ..lb.	...	.12	...	.12	.12	.15½
Fert grade, bgs, c. i. f. S.A. points ....ton	no prices		no prices		...	110.00
Dom f.o.b., wks ....ton	...	85.00	...	85.00	85.00	101.00
Urea Ammonia, liq., nitrogen basis ....ton	...	121.58	...	121.58	...	121.50
Valonia beard, 42%, tannin bgs ....ton	no prices		no prices		47.00	56.00
Cups, 32% tannin bgs..ton	no prices		no prices		33.00	39.00
Extract, powd, 63% ...lb.	no prices		no prices		.0565	.06
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots .....lb.	...	2.60	...	2.60	...	2.60
Ex-guaiacol ....lb.	...	2.50	...	2.50	...	2.50
Ex-lignin ....lb.	...	2.50	...	2.50	...	2.50
Vermilion, English, kgs ..lb.	3.12	3.17	3.12	3.17	...	2.76
Wattle Bark, bgs ....ton	39.50	41.50	37.50	41.50	34.00	38.75
Extract, 60°, tks, bbls..lb.	.04⅛	.04¼	.03⅞	.04¼	.03⅞	.04¼
Wax, Bayberry, bgs ......lb.	.18	.20	.18	.20	.25	.30
Bees, bleached, white 500 lb slabs, cases ....lb.	.43	.44	.36½	.44	.35	.38
Yellow, African, bgs..lb.	no stocks		...	.30	.23	.29
Brazilian, bgs .....lb.	no stocks		.31	.32	.24	.31
Refined, 500 lb slabs, cases lb.	.39	.40	.35	.40	.29	.36
Candelilla, bgs ....lb.	.22½	.23	.19	.23	.18	.19
Carnauba, No. 1, yellow, bgs ....lb.	...	.75	.68	.75	.58	.85
No. 2, yellow, bgs ...lb.	...	.74	.66	.74	.57	.84
No. 2, N. C., bgs ....lb.	...	.74	.62	.74	.46	.73
No. 3, Chalky, bgs ...lb.	...	.66	.55	.66	.43	.66
No. 3, N. C., bgs ....lb.	...	.68	.58	.68	.47	.68
Ceresin, dom, bgs .....lb.	.11	.11½	.11	.11½	.11½	.15
Japan, 224 lb cases ....lb.	.18	.18½	.16½	.18½	.15½	.16½
Montan, crude, bgs ....lb.	no prices		no prices		no prices	
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.24	.25	.24	.25	.22	.25
Cakes, cases ....lb.	.25	.26	.25	.26	.23	.25
Wood Flour, c-l, bgs ....ton						
bgs, c-l, wks ....ton	24.00	25.00	24.00	25.00	20.00	30.00
Whiting, chalk, com 200 lb	18.00	19.00	18.00	19.00	11.50	19.00
Gilders, bgs, c-l, wks ..ton	16.00	20.00	16.00	20.00	12.00	20.00
Xylol, frt all'd, East 10° tks, wks ....gal.	...	.29	...	.29	...	.30
Com'l tks, wks, frt all'd gal.	...	.26	...	.26	...	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Zein, bgs, 1000 lb lots, wks ....lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv ....lb.	.15	.16	.15	.16	.15	.16
Arsenite, bgs, frt all'd..lb.	...	.12	...	.12	.12	.12½
Carbonate tech, bbls, NY lb.	.14	.16	.14	.16	.14	.16
Chloride fused, 600 lb drs, wks ....lb.	...	.04¼	...	.04¼	.04¼	.046
Gran, 500 lb drs, wks lb.	...	.05	...	.05	.05	.05¾
Soln 50%, tks, wks 100 lb.	...	2.25	...	2.25	...	2.25

* June 30.

Current

Zinc Cyanide
Oil, Whale

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Zinc (continued):						
Cyanide, 100 lb drs ....lb.	.33	.35	.33	.35	...	.33
Dust, 500 lb bbls, c-l, delv lb.	...	.09¼	...	.09¼	.07⅓	.08½
Metal, high grade slabs, c-l, NY ....1000 lb.	...	7.65	...	7.65	5.90	7.64
E. St. Louis .....100 lb.	...	7.25	...	7.25	4.60	7.25
Oxide, Amer, bgs, wks lb.	...	.06½	...	.06½	.06¼	.07½
French 300 lb bbls, wks lb.	...	.06¾	...	.06¾	.06¼	.07¾
Palmitate, bbls ....lb.	.24½	.27½	.24½	.27½	.23	.27½
Resinate, fused, pale bbls lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls .....lb.	.25	.27	.22	.27	.21½	.24½
Sulfate, crys, 40 lb. bbls wks ....lb.	...	.365	.315	.365	.0275	.029
Flake, bbls ....lb.	...	.405	.335	.405	...	.0325
Sulfide, 500 lb bbls, delv lb.	...	.08	...	.08	.07¾	.08
bgs, delv ....lb.	...	.07¾	...	.07¾	.07½	.07¾
Sulfocarbolate, 100 lb kgs lb.	.24	.29	.24	.29	.24	.26
Zirconium Oxide, crude, 70-75% grd, bbls, wks ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Babassu, tks, futures .....lb.	no prices		...	.06	.05¾	.06⅝
Castor, No. 3, 400 lb drs lb.	.12	...	.09¾	.11¼	.09¾	.12¾
Blown, 400 lb drs ..lb.	...	.13¼	.11¾	.13¼	.11¾	.14¾
China Wood, drs, spot NY lb.	...	.32	.27¼	.32	.22½	.28
Tks, spot NY ....lb.	.30¼	.30½	.26¼	.30½	.21½	.27
Coconut, edible, drs NY .lb.	...	.13	.08	.13	.07½	.09⅜
Manila, tks, NY ....lb.	.07	nom.	.03⅜	.07	.02¾	.03⅜
Tks, Pacific Coast ....lb.	...	no prices		.03¼	.02¾	.03½
Cod, Newfoundland, 50 gal bbls ....gal.	.74	nom.	.60	.75	.60	.72
Copra, bgs, NY ....lb.	...	.0385	.0180	.0385	.0165	.0190
Corn, crude, tks, mills ...lb.	.09⅜	nom.	.06⅝	.09⅜	.05⅛	.06½
Refd, 375 lb bbls, NY ..lb.	.11½	nom.	...	.11½	.07⅞	.09
Degras, American, 50 gal bbls, NY ....lb.	.08	.08½	.07½	.08¾	.08	.10
Greases, Yellow ....lb.	...	.07⅜	.04¾	.07⅜	.03	.05¼
White, choice, bbls, NY lb	nom.	.07⅞	.05	.07⅞	.03⅜	.05⅝
Lard, Oil, Edible, prime ..lb.	...	.10¾	.08½	.10¾	.08	.10
Extra, bbls ....lb.	...	.11¼	.08¼	.11¼	.06¾	.09⅜
Extra, No. 1, bbls .....lb.	...	.11	.08	.11	.06⅞	.08⅞
Linseed, Raw less than 5 drs lots ....lb.		.123	.091	.123	.09	.116
drs, c-l, spot ....lb.	.170	.190	.095	.190	.084	.110
Tks ....lb	.1040	.1060	.084	.1060	.078	.104
Menhaden, tks, Baltimore gal	...	.60	.30	.60	.21	.35
Refined, alkali, drs .... lb	...	.114	.084	.114	.067	.088
Kettle boiled, drs ..... lb	...	.124	.096	.124	.079	.10
Light pressed, drs .... lb.	...	.104	.082	.104	.061	.085
Tks .... lb	...	.094	.072	.094	.055	.072
Neatsfoot, CT, 20°, bbls, NY lb	...	.23¾	.18¼	.23¾	.15¼	.19¼
Extra, bbls, NY ....lb.	...	.12	.08¼	.12	.06⅞	.09
Pure, bbls, NY ....lb.	...	.17¾	.12¼	.17¾	.08	.14¼
Oiticica, bbls ....lb.	.20	.20½	.16½	.20½	.17	.21
Oleo, No. 1, bbls, NY ...lb.	...	.11½	.07⅜	.11½	.07⅜	.07¾
No. 2, bbls, NY ......lb.	...	.11¼	.07⅜	.11¼	.07⅜	.07¾
Olive, denat, bbls, NY ..gal.	3.85	4.00	2.25	4.00	.94	2.40
Edible, bbls, NY .....gal.	5,00	5,25	...	5,25	1.85	3.25
Foots, bbls, NY ....lb.	.16¾	.17¾	.10¼	.17¾	.08	.10¼
Palm, Kernel, bulk ....lb.	no prices		no prices		no prices	
Niger, cks ....lb.	...	.06¾	.04¼	.06¾	.03¼	.05½
Sumatra, tks ....lb.	...	.06½	.02	.06½	.02⅛	.03
Peanut, crude, bbls, NY lb.	no prices		.08¾	.10	.06¾	.09
Tks, f.o.b. mill ....lb.	no prices		.05¼	.07⅛	.05⅛	.07⅛
Refined, bbls, NY .....lb.	no prices		.08	.13¼	.07⅜	.09¾
Perilla, drs, NY ....lb.	.19½	.20	.18	.20	.19	.21
Tks, Coast ....lb.	...	.18½	.16½	.18½	.18½	.20
Pine, see Pine Oil, Chem. Sec						
Rapeseed, blown, bbls, NY lb.	...	.17½	.16½	.17½	.17	.17½
Denatured, drs, NY . gal.	no prices		.95	1.00	1.00	1.05
Red, Distilled, bbls ......lb.	.11	.12	.07¼	.12	.06¼	.09½
Tks ....lb.	.10¼	...	.06¼	.11½	.05¾	.08
Sardine, Pac Coast, tks gal.	nom.	.55	.39	.55	.31	.39
Refined alkali, drs .... lb.	...	.108	084	.108	.067	.088
Light pressed, drs .....lb.	...	.098	.078	.098	.061	.082
Tks ....lb.	...	.088	.072	.088	.055	.072
Sesame, white, dom ..... lb.	nom.	.09½	...	.09½	.07¼	.11¾
Soy Bean, crude						
Dom, tks, f.o.b. mills ..lb.	...	.12¼	.05½	.12¼	.04¾	.06¼
Crude, drs, NY .....lb.	...	.12¼	.06¼	.12¼	.05¾	.07¾
Ref'd, drs, NY ....lb.	...	.12¾	.07⅝	.12¾	.07¼	.08½
Tks ....lb.	...	.12	05⅜	.12	.06¼	.07⅝
Sperm, 38° CT, bleached bbls, NY ....lb.	...	.117	.11	.117	.105	.11
45° CT, blchd, bbls, NY lb.	...	.11	.103	.11	.098	.103
Stearic Acid, double pressed dist bgs ....lb.	.12¾	.13¾	.09½	.13¾	.09¾	.13
Double pressed saponified bgs ....lb.	.13	.14	.09¾	.14	.10	.13¾
Triple pressed dist bgs lb.	.15½	.16½	.12½	.16½	.12½	.16½
Stearine, Oleo, bbls ......lb.	nom	09	..	.09	.05¼	.06½
Tallow City, extra loose ..lb.	.07⅜	..	...	.07⅜	.03⅜	.05⅜
Edible, tierces ....lb.	no prices			.05⅛	.04⅜	.05¾
Acidless, tks, NY .....lb.	...	.08¾	.07½	.08¾	.06¼	.08
Turkey Red, single, drs ..lb.	...	.06½	.06½	.07	.082	.09
Double, bbls ....lb.	...	.09½	.09½	.11	.11	.12¾
Whale:						
Winter bleach, bbls, NY lb.	...	.099	...	.099	...	.095
Refined, nat, bbls, NY lb.	...	.095	...	.095	...	.091

What Influences People
By C. A. Hazard

(*Continued from page 45*)

resulting in a steady development of newer and larger outlets.

In spite of the fact that hard boiled buyers pride themselves on their scientific methods of purchasing, the element of suggestion plays a tremendous role in influencing their ultimate decisions. Of course, we do not mean to say that it gets them to take inferior goods. On the contrary, it is the truth that an inferior product cannot survive long and advertising at best can merely serve to delay its demise. Where good advertising plays its most important role is in establishing an unconscious acceptance in the buyer's mind—creating a favorable impression about the company which ultimately gives it an opening where its value can be considered.

The process by which a prospect's resistance is broken down is gradual. It is the cumulative effect of a series of strong suggestions sustained over a period of time. It is based on the old psychological principle that people are and always have been notoriously subject to the power of suggestion—regardless of education or intelligence.

The advertiser who fails to use this power is neglecting one of the greatest and most influential forces in the modern business world—a force that has its roots deep in the nature of mankind.

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Booklets & Catalogs

Chemicals

A317. Dyestuffs; June, 1941. Contains articles on effect of gas fumes on dyed acetate rayon, abnormal varieties of cotton, the dyeing of military fabrics, acid wool dyes on fur felt hat bodies, and injury to fabrics due to perspiration. National Aniline & Chemical Co., Inc.

A318. Feed Water Chemistry; 12-page booklet giving fundamental reactions involved in water softening. "Ionic analysis" and "equivalents per million" methods of analysis are discussed in detail and stressed since they are coming into more general use. Cochrane Corp.

A319. Limestone and Lime; by George I. Whitlatch, associate geologist, Tennessee Dept. of Conservation. A 38-page summary of limestone and lime in response to frequent inquiries received by State Geologist Walter F. Pond from consumers, mineral-operating companies and prospectors as to the source of supply or markets for minerals. Written as a market circular, booklet lacks detail which department will supply on request. Replaces "Limestone" No. 3 of a series, issued in 1937. Includes new data on uses of lime as reagent in numbers processes, thus the combination title. Tennessee Department of Conservation, Division of Geology.

A320. Merck Laboratory Chemicals; complete catalog of chemicals with detailed information required by the laboratory chemist who employs them in his work. Merck & Co., Inc.

A321. Olev-ol; Folder describes new product to take the place of olive oil for technical purposes. The new product is derived by separating the fatty acid constituents of domestic vegetable, animal, and marine oils and recombining them in the correct proportion as found in the natural product. The Werner G. Smith Co.

A322. Patching and Waterproofing Concrete; Folder shows how seepage can be stopped, how holes, cracks and breaks can be repaired and how to make hard, dustproof and waterproof floors. Smooth-On Manufacturing Co.

A323. Principles of Sewage Treatment; 128-page booklet prepared by Dr. Willem Rudolfs, Chief, Dept. of Water and Sewage Research, Rutgers University. It is intended to be a useful reference for those who directly or indirectly are engaged in the work of sewage treatment and disposal. For those interested in learning about the factors which affect the activities of organisms, a brief expose on microbiology has been included, while the small plant operator may find some useful hints on operation and control. National Lime Association.

A324. Silicate of Soda Cements, Bulletin No. 241; Describes a number of cements, for many purposes, that can be made with the different silicates of soda. This bulletin includes the chief practical applications and formulae in current use. Philadelphia Quartz Co.

Equipment—Containers

E495. Chemical and Process Equipment; Describes and illustrates complete line of chemical processing and heat transfer equipment. The Patterson Kelly Co.

E496. Electrical Controls for Proportional Chemical Feeders; Publication 3015; Gives details of proportioner design and construction and applications, with flow diagrams, of flow meters to typical water conditioning control applications. Cochrane Corp.

E497. Homocarb Method for Carburizing; Catalog T-623. This 26-page book gives pictorial tour of representative heat-treats, shows a score of furnaces in action, shows various types of work being carburized. It is illustrated with photographs, diagrams, charts and photomicrographs. Leeds & Northrup Co.

E498. Laboratory Furniture; 142-page, spiral bound book of complete furnishings. Each item is illustrated and completely described. Kewaunee Mfg. Co.

E499. Modern Filtration; Describes the use of filter aids to obtain better flow rates and increased clarity. The Dicalite Co.

Packings; Illustrated catalog of packings and gaskets, containing service recommendations and suggestions. Includes handy recommendation tables which serve as a guide to proper packing selection for various types of equipment under such service conditions as steam, brine, ammonia, acids, caustics, and oils. Johns-Manville.

E500. Process Equipment; 28-page catalog describing complete line of agitators, mixers, digesters, kettles, ball mills and pebble mills gives specification tables, pictures and descriptions. Enables reader to determine speeds, sizes, etc. H. K. Porter Company, Inc.

E501. Rotary Pumps; Handy folder describes and illustrates hand pumps, power pumps, motor driven twin and multiple pumps, truck pumps, sanitary pumps, and pressure controls and accessories. Blackmer Pump Co.

E502. San-I-Tanks; Describes, illustrates and gives engineering specifications for glass lined, stainless steel and alloy metal tanks. Metal-Glass Products Co.

E503. Steam Sample Degasifier; 4-page folder describes and illustrates unique device for condensing a steam sample, separating non-condensible gases for analysis, and degasifying the condensed sample for conductivity tests for determination of carry-over. Cochrane Corp.

E504. Wet and Dry Test Meters; Catalog AG-3. 16 pages, full of illustrations, technical data and full details about wet and dry test meters. Includes a four-page gate-fold of specifications for wet and dry test meters. American Meter Co., Inc.

E505. The History. Purpose and Practice of Metallizing (Metal Spraying); 52-page fully-illustrated booklet describing a metal spraying process "unlike any other in metal working, a process which makes it possible to do things that no other procedure can accomplish." Describes and illustrates a number of specific applications. Metallizing Company of America, Inc.

E506. Vertical Hammer Mill, Leaflet B-6169; Covers new compact vertical motor driven hammer mill for grinding grain, by-products of flour and cereal mills, chemical and mineral products, etc. Includes dimension details, sectional and installation views. Allis-Chalmers Mfg. Co.

E507. Towmotors; Folders describing and illustrating straight gasoline powered material handling lift trucks and tractors. Towmotor Co.

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"We"—Editorially Speaking

The War Department's Bureau of Public Relations paused on June 10 to inform the world in a general news release that "Two swallows (feathered ones) caused a slight temporary jam in the defense program at Fort Cronkhite, California, last week." Release also stated that "photographs can be obtained at the Bureau of Public Relations." Instead of publishing the picture for your amusement we suggest that you read the lead editorial in this issue entitled "Is Now the Time for Economy?"

Small business is business that some day hopes to be "big business."

Have you sent your contribution to the USO? In case you are a little groggy from the alphabetical soup of the last eight years we report that USO stands for United Service Organizations—the organization that seeks funds to provide much needed recreational facilities for our soldiers and sailors.

We see by the papers

"While the President's long awaited show of firmness has been popularly received by a public plenty fed up with such strikes, the United States Army is not a good substitute for a sound national labor policy. The corner policeman could do this job as well as the army private if he would only abandon the policy of putting labor above or beyond the law." Walter D. Fuller, President, National Association of Manufacturers.

"Our leaders are in a tough spot, with an unfinished social revolution on their hands . . . with government credit already burdened by an unprecedented debt, and with most of the key posts filled by men unfriendly to industry and committed to the principle that labor can do no wrong. It is not easy to convert this organization into one for out-producing the world. We are still trying to grow a defense head on a New Deal body and tail. Co-ordination is lacking, and the tail seems at times to be wagging the dog." William E. Wickenden, President, Case School of Applied Science.

"Only a complete escapist will commend Congress for its delay in writing tax legislation. A heavy blow will fall on millions of American taxpayers on March 15 next and these millions would like to know as soon as possible the exact extent of the blow." The N. Y. Sun, June 21.

FIFTEEN YEARS AGO

From Our Files of July, 1926

Albert W. Hawkes, executive vice-president, General Chemical, resigns to become connected with Congoleum-Nairn.

Butterworth-Judson creditors get 10 per cent.

Gasoline prescribed as a denaturant for completely denatured alcohol.

Germany's synthetic automobile fuel is discussed in "Germany's Chemical Colossus," (July 22, p. 435).

Donald B. Keyes, U. S. Industrial Alcohol, becomes head of the industrial chemical division of the University of Illinois.

Chromium Corp. of America formed to acquire patents developed by Chemical Treatment Co. and Chromium Products Corp.

Allen Abrams, Cornell Wood Products, becomes chief chemist for Marathon Paper Mills Co.

Col. Herman A. Metz acts as mediator between striking motormen and the company in the New York subway strike.

"In the shadows that are deepening over Europe the lights of learning are fading one by one. The conception of knowledge as an international responsibility has vanished. The free flow of ideas across boundary lines between laboratories and universities has dried up. Everywhere the exigencies of war have erased the possibility of intellectual and cultural life as that term was understood a few years ago." Raymond B. Fosdick, President, Rockefeller Foundation.

Thanks a lot!

The host of friends of Fred Neuberg, Westvaco Chlorine, will be overjoyed to learn of his complete recovery from his recent serious illness. We are indebted to "Bob" Quinn of Mathieson Alkali for the card reproduced.

Did you know—

That Standard Oil of New Jersey pays $1,541 in direct taxes for each domestic employee?

That bearings for machinery made from the same basic material as nylon hosiery are said to require no oil for lubrication?

We wish to publicly thank two of "C. I."'s *ex-officio* photographers, John Karr of Victor Chemical who is the responsible party for several fine pictures on the Manufacturing Chemists' Association gatefold, and Harold Fyffe of Oldbury Electrochemical for the splendid shots taken at the Salesmen's Association's first golf meeting. Bureau of Internal Revenue take notice.

A. D. McFadyen of the United States Patent Office in Washington and author of the very popular "Personalities in Chemistry" series, is taking a summer "leave of absence" from the pages of CHEMICAL INDUSTRIES. We are most hopeful he will again be with us after the heat and we don't mean "heat" of Washington has subsided somewhat. Perhaps some of the readers of "We"—Editorially Speaking who have enjoyed this unusual feature will add their persuasive powers to ours.

We are delighted to be able to publish in this issue Williams Haynes' article "The Bowers of Philadelphia"—one more in the second series of "Chemical Pioneers." The first series is now in book form (D. Van Nostrand and Co.). Mr. Haynes is busy these days at Stonecrop Farm, North Stonington, Conn., working on his history of the American Chemical Industry.

We notice now that Mrs. Roosevelt is on our side. Says she in *Look* for July 15 in an article entitled "What's Wrong with the Draft"—To illustrate—"A chemist or an engineer might be considered more valuable to the country after his college education was completed."

And this reminds us that chemists and chemical engineers are given prominence in Selective Service Circular No. 3 of May 24—latest instructions—we better say suggestions to local draft boards.

State of Chemical Trade

Current Statistics (June 30, 1941)—p. 84

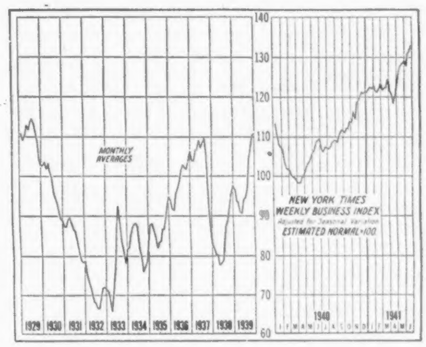
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1941	Carloadings 1940	Carloadings % of Change	Electrical Output† 1941	Electrical Output† 1940	Electrical Output† % of Change	Jour. of Com. Price Index	*Nat'l Fertilizer Ass'n Chem. & Drugs	*Nat'l Fertilizer Ass'n Fats & Oils	*Nat'l Fertilizer Ass'n Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
June 7	852,940	702,892	+21.3	3,042,128	2,598,812	+17.1	90.6	105.0	110.8	104.7	101.1	107.7	83.6	99.2	128.0	92.8
June 14	862,975	712,921	+21.0	3,066,047	2,664,853	+15.1	91.1	105.0	113.9	104.7	101.1	108.9	83.7	98.6	130.7	93.4
June 21	885,558	728,493	+21.6	3,055,841	2,653,788	+15.2	91.2	105.0	118.2	104.7	102.0	110.2	83.8	99.0	131.4	94.3
June 28	908,664	752,647	+20.7	3,120,780	2,659,825	+17.3	91.0	105.2	124.6	105.5	102.0	110.9	84.3	99.9	132.8	95.1

MONTHLY STATISTICS

CHEMICAL:	May 1941	May 1940	Apr. 1941	Apr. 1940	Mar. 1941	Mar. 1940
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	......	......	218,846	192,846	234,026	196,290
Consumpt. in mfr. fert.	......	......	156,362	140,272	177,376	149,303
Stocks end of month	......	......	93,956	94,820	98,151	93,231
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.	29,606,217	20,947,639	26,248,451	20,217,862	21,702,074	20,983,159
Comp. denat. prod., wine gal.	951,787	784,465	294,890	267,688	513,986	413,509
Removed, wine gal.	928,520	704,490	325,044	229,930	519,084	399,479
Stocks end of mo., wine gal.	460,551	457,963	440,092	378,240	470,282	340,800
Spec. denat. prod., wine gal.	13,762,183	9,252,972	12,358,711	9,726,136	12,678,139	9,110,799
Removed, wine gal.	13,960,954	9,332,121	12,125,576	9,561,557	12,819,899	9,094,254
Stocks end of mo., wine gal.	868,677	1,127,597	1,070,625	1,212,441	842,969	1,051,623
Ammonia sulfate prod., tons *a*	61,495	57,780.5	57,916.5	54,570	645,235	56,054
Benzol prod., gal. *b*	12,085,000	10,397,000	11,649,000	9,588,000	13,505,000	9,952,000
Byproduct coke, prod., tons *a*	4,845,854	4,256,000	4,474,315	3,984,347	4,999,309	4,124,748
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	935,239	544,352	927,399	532,327	844,819	789,307
Sheets, ship., lbs.	863,997	645,921	819,485	561,119	794,199	607,267
Rods, prod., lbs.	306,749	188,938	356,179	245,078	363,429	231,297
Rods, ship., lbs.	346,031	222,296	342,448	231,937	342,024	255,511
Tubes, prod., lbs.	130,457	67,056	136,048	74,849	99,345	69,036
Tubes, ship., lbs.	104,711	58,211	104,665	55,106	96,298	61,739
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	524,393	702,385	402,492	558,358	464,601	550,138
Shipments, lbs.	472,328	648,535	408,252	490,206	372,804	588,516
Molding comp., ship.; lbs.	2,145,523	837,151	2,102,084	903,785	1,990,982	1,021,579
Methanol (Bureau of the Census)						
Production, crude, gals.	463,013	441,888	454,817	506,937	454,817	506,937
Production, synthetic, gals.	3,698,328	3,486,233	3,672,830	3,462,946	3,672,830	3,462,946
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.	4,733,765	2,639,599	4,158,396	2,859,620	3,806,132	2,793,435
Heavy goods, ship., linear yds.	3,189,224	1,864,260	3,158,924	2,143,781	3,294,035	2,184,457
Pyroxylin spreads, lbs. *c*	7,350,684	4,102,401	6,930,713	4,772,332	6,691,648	4,769,189
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*	......	......	......	......	$20,863	$18,780
Crude sulfur *d*	......	......	......	......	$222	$419
Coal-tar chemicals *d*	......	......	......	......	$2,706	$2,539
Industrial chemicals *d*	......	......	......	......	$5,082	$4,467
Imports						
Chemicals and related prod. *d*	......	......	......	......	$5,537	$6,681
Coal-tar chemicals *d*	......	......	......	......	$593	$1,113
Industrial chemicals *d*	......	......	......	......	$996	$1,108
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	......	......	133.7	123.4	130.7	122.8
Other than petroleum	......	......	136.8	123.9	133.4	123.1
Chemicals	......	......	160.7	135.2	159.3	135.6
Explosives	......	......	Not available	......	160.7	107.8
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	......	......	154.8	133.4	148.2	132.5
Other than petroleum	......	......	158.8	132.3	152.7	131.5
Chemicals	......	......	205.4	159.6	201.7	139.3
Explosives	......	......	Not available	......	206.6	128.8
Price index chemicals*	......	......	86.4	85.0	85.9	85.1
Drugs & Pharmaceuticals*	......	......	97.5	81.8	97.2	81.4
Fert. mat.*	......	......	71.0	70.7	70.4	70.6
Paint and paint mat.	......	......	88.7	86.7	87.4	87.2
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	......	......	74,715	65,798	90,255	60,332
Total phosphate rock	......	......	43,988	25,168	58,678	31,691
Total potash fertilizers	......	......	4,560	535	3,351	637
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	......	......	118,353	146,517	154,574	181,636
Sodium nitrate	......	......	79,969	89,679	84,337	86,039
Total potash fertilizer	......	......	1,688	19,553	14,110	40,094

INDUSTRIAL TRENDS



Business: Industrial activity has increased sharply during May and June. In May the Federal Reserve Board's seasonally adjusted index of industrial production was up a full 9 points to 149. The accelerated pace has been maintained and the index for June is estimated at 156. *The New York Times* weekly index of business activity has also shown large increases, going from 128.0 on June 7 to 132.8 on June 28.

Steel: Production has been maintained at about 99 per cent of capacity for several weeks. There was a curtailment in the holiday week of July 4, but this was one of the smallest holiday dips on record and operations are expected to rebound immediately to near capacity levels. As it became apparent that combined military and civilian need for metal would soon greatly exceed available supplies, a general preference order was issued by the Priorities Division of the Office of Production Management. In spite of these Government regulations unfilled orders continue to expand. Sales volume is about 135-150 per cent of capacity.

Carloadings: Loadings of revenue freight continue at record levels. Each of the first four weeks of June saw a substantial increase. The average increase for these weeks over the similar period of last year amounted to a little better than 21 per cent.

In June orders were placed for 29,799 freight cars, a new record. Along with this came an order from the Office of Price Administration and Civilian Supply that freight car builders were to be given first call on steel and other required materials, after military needs are filled.

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Automotive: Production during May totaled 545,321 units, the highest figure for any similar month since 1929. The rapid pace was continued during June with an estimated output of better than 500,000 units.

Inquiries and sales continue at a high rate. So much so that the industry is faced with some serious problems. What with the new model year ready to begin and with orders already large enough to indicate a carryover and with a continued and more assured likelihood that more and more of the defense production load will be shunted to its shoulders, the automobile industry does not face a restful future.

Construction: Construction contracts still show sharp increases. Values of awards in both public and private construction participate in the better seasonal increases.

Textiles: Activity in textile mills has expanded. Demand for cotton textiles is now running well in excess of supply. Wool, silk and rayon are also in great demand.

Retail Trade: Distribution of commodities to consumers remained at high rate during May. During most of June sales did not come up to the usual seasonal increase and it is likely that the Federal Reserve Board department store sales index will drop from the May figure of 106.

Electric Output: The consumption of electrical power has been steadily growing. It has now reached the point where shortages are a reality. Some forced curtailment of non-defense production, which may take place, is thought in some quarters to be likely to alleviate the possibility of a serious shortage. This is open to serious question however as any release of power in this direction will probably be more than taken up by increased demand.

Commodity Prices: Wholesale prices showed considerable increases through June. Federal action to limit prices has now been extended to some consumer goods, principally new automobiles, hides and certain cotton yarns. There have been a number of increases in chemicals and other commodities.

Outlook: Nothing has happened to change the outlook as far as industrial production is concerned, except that there will probably be a greater effort. With a greater effort and the fact that many plants are getting "in the groove" the armament program should go ahead more rapidly in actually getting out production. This will mean the requirements of more materials and labor. All this is going to have effect on the price structure. It seems likely that one of the next things in order is more definite control of prices.

MONTHLY STATISTICS (cont'd)

FERTILIZER: (Cont'd)	1941	1940	Apr. 1941	Apr. 1940	Mar. 1941	Mar. 1940
Superphosphate e (Nat. Fert. Association)						
Production, total	......	......	......	......	363,233	296,798
Shipments, total	......	......	......	......	662,592	594,321
Northern area	......	......	......	......	239,439	165,041
Southern area	......	......	......	......	423,153	429,280
Stocks, end of month, total	......	......	......	......	1,707,794	1,734,663
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	......	......	1,461,189	1,183,033	1,487,101	1,639,828
Total, 12 southern	......	......	1,390,782	1,125,397	1,367,307	1,538,065
Total, 5 midwest	......	......	70,407	57,636	119,794	101,763
Fertilizer employment *i*	......	......	177.2	174.8	140.9	151.8
Fertilizer payrolls *i*	......	......	173.1	136.2	116.9	112.7
Value imports, fert. and mat. *d*	......	......	......	......	$2,901	$3,737
GENERAL:						
Acceptances outst'd'g *f*	......	......	$219	$223	$217	$229
Coal prod., anthracite, tons	......	......	3,198,000	3,746,000	4,595,000	3,773,000
Coal prod., bituminous, tons	......	......	5,975,000	32,790,000	48,250,000	35,244,000
Com. paper outst'd'g *f*	......	......	$274	$238	$263	$233
Failures, Dun & Bradstreet	......	......	1,149	1,291	1,211	1,197
Factory payrolls *i*	......	......	134.4	97.9	131.2	99.8
Factory employment *i*	......	......	122.3	103.2	119.9	104.4
Merchandise imports *d*	......	......	......	......	$267,784	$216,755
Merchandise exports *d*	......	......	......	......	$357,565	$350,784
GENERAL MANUFACTURING:						
Automotive production	518,736	391,215	462,257	432,746	507,868	423,620
Boot and Shoe prod., pairs	41,087,435	42,841,403	42,772,202	31,816,239	42,662,834	34,550,750
Bldg. contracts, Dodge *j*	......	......	$406,675	$300,504	$479,903	$272,178
Newsprint prod., U. S. tons	......	......	......	......	87,376	85,143
Newsprint prod., Canada, tons.	......	......	......	......	275,769	251,279
Glass containers, gross‡	6,246	4,701	5,325	4,584	5,128	4,606
Plate glass prod., sq. ft.	......	......	......	......	18,266,400	14,302,100
Window glass prod., boxes	......	......	......	......	1,416,869	1,107,400
Steel ingot prod., tons	......	......	......	......	42,662,834	34,550,750
% steel capacity	......	......	......	......	$479,903	$272,178
Pig iron prod., tons	......	......	......	......	4,704,135	3,270,499
U.S. cons'pt. crude rub., lg. tons	......	......	71.374	50,103	69,024	50,192
Tire shipments	......	......	......	......	5,528,552	4,345,674
Tire production	......	......	......	......	5,686,686	5,007,042
Tire inventories	......	......	......	......	10,168,237	10,747,370
Cotton consumpt., bales	918,902	641,636	920,142	623,098	854,179	626,331
Cotton spindles oper.	......	......	22,787,396	22,288,832	22,795.742	22,553,360
Silk deliveries, bales	21,940	18,997	22,100	20,116	24,187	19,596
Wool consumption *s*	51,6	26.9	......	21.4	......	26.7
Rayon deliv., lbs.	40,200,000	31,900,000	38,700,000	......	35,400,000	29,800,000
Rayon employment *i*	......	......	318.1	305.8	312.2	309.0
Rayon payrolls *i*	......	......	338.1	311.1	332.9	316.0
Soap employment *i*	......	......	91.1	81.2	90.7	82.7
Soap payrolls *i*	......	......	115.5	98.0	114.8	99.5
Paper and pulp employment *i*	......	......	120.2	112.0	118.5	112.6
Paper and pulp payrolls *i*	......	......	139.0	115.4	136.4	115.1
Leather employment *i*	......	......	90.1	82.7	89.1	84.0
Leather payrolls *i*	......	......	95.1	78.2	94.3	80.4
Glass employment *i*	......	......	121.5	105.3	119.7	106.2
Glass payrolls *i*	......	......	142.6	114.2	141.1	112.8
Rubber prod. employment *i*	......	......	105.1	84.7	102.9	87.2
Rubber prod. payrolls *i*	......	......	121.5	86.5	119.5	88.3
Dyeing and fin. employment *i*	......	......	143.7	125.4	142.0	128.1
Dyeing and fin. payrolls *i*	......	......	134.6	104.7	133.3	108.7
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)[1]	......	......	110.2	61.8	93.7	59.9
Gasoline prod., *p*	......	......	53,768	50,625	48,606	44,607
Cottonseed oil consumpt., bbls.	377,948	299,833	400,155	255.693	314,505	243,671
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	$58,413,147	$43,463,222	$51,963,528	$37,656,398	$40,185,294	$31,592,093
Trade sales (580 estbts.) dollars	$32,517,730	$24,943,448	$27,972,286	$20,188,957	$19,565,515	$16,144,606
Industrial sales, total, dollars	$20,544,153	$14,150,310	$19,266,308	$13,849,723	$17,033,354	$12,639,821
Paint & Varnish, employ. *i*	......	......	137.1	124.4	132.9	123.5
Paint & Varnish, payrolls *i*	......	......	158.0	131.9	147.4	130.5

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted. 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

Chemical Sales and Profits

The chemical industry, leader of "growth" industries, is expanding steadily each month but is just about able to keep in the same place so far as earnings are concerned. The industry's sales are running nearly double what they were in the record year 1939. In that year profits far exceeded those of the record year 1929, because of new products and new industries that chemists created.

Taxes are, of course, the answer to lower profits, although higher wages and more cautious bookkeeping have some effect. Profits before taxes in many cases are running 2½ to 3 times what they were in 1939. After taxes they are running only 15% to 20% ahead of 1939.

Generally speaking, profits in the first quarter were about the same as in the first quarter last year, after adjusting last year's profits to the 1940 tax law.

With production and sales of chemicals mounting month by month, earnings in the June quarter will be slightly ahead of the March period. The last six months of the year are seasonally the best, so that last half profits will show a moderate uptrend, even making allowance for anticipated tax increases.

However, future gains will begin to be limited by the fact that the industry is really at its peak; its plants are working at capacity and the industry is selling all it produces. Any growth must come from new plant capacity.

New plants built from now on will be mostly defense plants and these, if financed by the government, will be operated on a rigidly limited profit basis. If financed by the companies the plants will be written off the books on a scale that will more likely detract from rather than add to current profits.

U. S. I. Earns $2.72

U. S. Industrial Alcohol Co. as a result of research in the chemical field, is now deriving about 25% of its sales volume from new products that it did not have five years ago. Due to this increasing diversification, total sales of chemical products, other than industrial alcohol, are now greater in volume than the sales of alcohol, once the company's principal product.

Net income reported for the fiscal year ended March 31, after estimated taxes, was $1,067,767, equal to $2.72 a share on 391,238 shares of capital stock. Directors have approved a proposal to revalue plants and property at a total of $9,493,255 against fixed assets of $3,611,650 now carried in the balance sheet. In December, 1932, plants with a book value of about $22 million were written down to $1 while additions made since then have been carried at cost less depreciation.

Dividends and Dates

Name	*Per Share*	*Payable*	*Stock Record*
Abbott Laboratories, 4½% pref. (quar.)	$1.125	July 1	July 15
Air Reduction Co., Inc.. (quar.)	.25	July 5	July 15
Extra	.25	July 5	July 15
Chemical Fund, Inc.	.08	June 30	July 15
Corn Products Refining Co. Common (quar.)	.75	July 3	July 15
7% pref. (quar.)	1.75	July 3	July 15
Dow Chemical Co., Common	.75	Aug. 1	Aug. 15
5% pref. (quar.)	1.25	Aug. 1	Aug. 15
du Pont (E.I.) de Nemours & Co. 4.50 pref. (quar.)	1.125	July10	July 25
Fansteel Metallurgical Corp. $5 pref. (quar.)	1.25	Sept. 15	Sept. 30
$5 pref. (quar.)	1.25	Dec. 15	Dec. 18
Hercules Powder Co., 6% pref. (quar.)	1.50	Aug. 4	Aug. 15
Hooker Electrochemical Co. 6% pref. (quar.)	1.50	Sept. 12	Sept. 30
Common (irreg.)	.30	Aug. 12	Aug. 30
International Nickel Co., Inc. of Canada, 7% pref. ($100 par, quar.)	1.75	July 2	Aug. 1
7% pref. ($5 par, quar.)	.0875	July 2	Aug. 1
National Lead Co., 6% pref. B (quar.)	1.50	July 18	Aug. 1
Newport Industries, Inc.	.25	July 12	July 16
Phelps Dodge Corp. (increased)	.50	Aug. 15	Sept. 10
Squibb (E.R.) & Sons, $5 pref. series A (quar.)	1.25	July 15	Aug. 1
U. S. Industrial Alcohol Co. (quar.)	1.25	July 15	Aug. 1
U. S. Smelting, Refining & Mining Co.	1.00	June 25	July 15
7% pref. (quar.)	.875	June 25	July 15

Earnings Statements Summarized

Company	Annual dividends	Net income 1941	Net income 1940	Common share earnings 1941	Common share earnings 1940	Surplus after dividends 1941	Surplus after dividends 1940
Celanese Corp. of America: Month of April	x$1.25	z$1,200.000	*	...	...	......	......
Celotex Corp.: Month of April	y .62½	v 235,000	v 126,000	...	...	......	......
Commercial Alcohols, Ltd.: Year, March 31	.15	73,515	97,429	h.28	h.41	......	......
Derby Oil & Refining Corp.: Mar. 31 quarter	f ...	11,921	† 15,215	p.63	...	......	......
Ferro Enamel Corp.: March 31 quarter	y 1.00	143,785	123,409	.62	.53	......	......
International Vitamin Corp.: Nine months, March 31	y .30	121,067	113,619	.59	.56	......	......
U. S. Industrial Alcohol: Year, March 31	y .50	1,067,768	*	2.72	...	872,149	......
United States Smelting Rfg. & Mng. Co.: Five months, May 31	6.00	1,547,775	1,944,031	1.64	2.39	......	......
Vick Chemical Co.: March 31 quarter	y 3,00	625.066	595,655	92	.86	......	......
Nine months, March 31	y 3.00	2,576,887	2,546.685	3.78	3.66	......	......
Westinghouse Electric & Mfg Co.: Five months, May 31	5.00	9,998,347	8,392,174	3.74	3.14	......	......

a On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *b* On Preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods. ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available. ¶¶ Before interest on income notes. *x* Paid on or declared in last 12 months plus extra stock. *w* Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	June 7	June 14	June 21	June 28	Net gain or less last mo.	Price on June 29 1940	1940 High	1940 Low
Air Reduction Co.	40	41⅝	42½	41⅞	+1⅞	39¼	42¾	35¾
Allied Chemical & Dye	150⅛	154	152	152½	+2⅜	148	165	144½
Amer. Agric. Chem.	17¼	17⅝	18	17⅛	— ⅛	15	18⅜	14⅜
American Cyanamid "B"	36⅞	37¼	37¾	38¼	+1⅜	32½	38¼	31
Columbian Carbon	74	76	79¾	80	+6	81	80⅛	69⅞
Commercial Solvents	9⅞	10	10⅛	10	+ ⅛	9⅛	11½	8⅜
Dow Chemical Co.	127	128½	125	128	+1	154	141¾	120
du Pont de Nemours	150	150½	152½	154¾	+4¾	158	164¾	138
Hercules Powder Co.	69¾	82	71½	71	+1¼	85	77½	66
Mathieson Alkali Co.	27¼	27¾	28⅝	28½	+1¼	25½	30	24⅛
Monsanto Chem. Co.	79¼	80½	81½	82⅝	+3⅜	92	88½	77
Standard Oil of N. J.	38	39½	39¼	40½	+2½	33	42⅞	33
Texas Gulf Sulphur	35	35½	35¼	36	+1	30⅝	38	31½
Union Carbide & Carbon	71¾	72	71⅛	72	+ ¼	69½	72⅞	60
U. S. Industrial Alcohol	24½	25⅞	24⅞	25¼	+ ¾	19	28¾	20

Heyden Stock Offered

A. G. Becker & Co., Inc., is the head of a group that has offered 20,000 shares of Heyden Chemical Corp. 4½% cumulative preferred stock, Series A, $100 par value, at $100.50 and accrued dividends from June 1, 1941.

Proceeds from the sale of the stock will be used as follows: The purchase or redemption of all the outstanding 3,100 shares of 7% cumulative preferred stock at $110 per share and accrued dividends to October 1, 1941; approximately $800,000 for additional buildings, machinery and equipment at the company's plants at Garfield and Fords, N. J.; approximately $300,000 for the construction and equipment of new boiler and power units; and the prepayment of outstanding serial notes in the amount of $250,000.

After completion of the present financing, the company's capitalization will consist of the 20,000 shares of preferred stock now offered, and 125,496 3/5 shares of $10 par value common stock.

Other members of the underwriting group are Merrill Lynch, E. A. Pierce & Cassatt, Hornblower and Weeks, and Ladenburg, Thalmann & Co.

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Chemical Stocks and Bonds

NEW YORK STOCK EXCHANGE

Price Range June 1941 Last	June 1941 High	Low	1940 High	1940 Low	1939 High	1939 Low	Sales (Number of shares) June 1941	Sales 1941	Stocks	Par $	Shares Listed	Dividends 1940*	Earnings** $-per-share-$ 1940	1939	1938
50	53	46	70¼	49¼	71½	53	2,400	14,400	Abbott Labs.	No	755,204	2.15	2.89	2.61	2.43
41¾	42¾	35¾	58⅛	36½	68	45¼	15,100	147,600	Air Reduction	No	2,711,137	1.75	2.38	1.98	1.47
152½	165	144½	182	135½	200½	151½	7,200	40,400	Allied Chem & Dye	No	2,401,288	6.00	9.43	9.50	5.92
17½	18⅜	14⅝	21	12⅛	24½	16	7,100	34,100	Amer. Agric. Chem.	No	627,981	1.20	1.45	1.22	2.23
5¼	6⅛	4⅝	8¼	4⅛	11⅞	5½	2,500	21,400	Amer. Com. Alcohol	No	280,934	...	.22	—.38	—2.05
29	30	26	35½	23	37	21	2,000	7,800	Archer-Dan.-Midland	No	545,416	1.40	5.71	3.82	.43
64	72¼	61	80½	57	71	50	600	4,800	Atlas Powder Co.	No	252,278	4.25	5.71	3,82	2.69
115	118½	111	124¾	112½	127	116	110	1,670	5% conv. cum. pfd.	100	68,597	5.00	26.01	18.94	14.77
22½	28⅜	18⅜	35½	20	30¼	13⅝	11,600	69,900	Celanese Corp. Amer.	No	1,112,788	1.25	3.38	3.53	.20
118	120¾	116⅝	121	105½	109⅞	84	1,290	8,390	prior pfd.	100	164,818	7.00	38.69	38.67	15.05
13	14	11⅛	20	10⅛	18	11½	9,500	79,700	Colgate-Palm.-Peet	No	1,962,087	1.00	1.72	2.74	1.77
79	80⅛	69⅞	98¾	71	96	73	2,300	10,300	Columbian Carbon	No	537,406	4.60	5.71	5.32	5.13
10	11½	8⅜	16⅝	8	16	8⅝	21,400	179,600	Commercial Solvents	No	2,636,878	.25	.91	.61	—.11
48⅝	49	42¼	65⅛	40¼	67½	54⅞	8,600	85,500	Corn Products	25	2,530,000	3.00	3.10	3.32	3.18
176¼	182½	170	184	165	177	150	730	4,210	7% cum. pfd.	100	245,738	7.00	38.99	41.18	30.69
15¼	17¼	13	23¼	12½	32⅝	18	2,530	14,280	Devoe & Rayn. A.	No	95,000	.25	1.14	2.08	—1.72
127⅝	141¾	120	171	127¼	144⅝	101½	3,700	21,400	Dow Chemical	No	1,135,187	3.00	6.65	3.76	3.91
154½	164¾	138	189¼	146½	188½	126¼	18,600	143,800	DuPont de Nemours	20	11,065,762	7.00	7.23	7.70	3.74
124	126½	120⅞	129⅝	114	124⅛	112	1,000	14,750	4½% pfd.	No	1,688,850	4.50	51.48	52.25	87.27
134⅜	142	120¼	166¾	117	186⅛	138⅛	9,900	49,700	Eastman Kodak	No	2,488,242	6.00	7.96	8.55	7.54
174½	182½	160	180	155	183½	155½	160	1,670	6% cum.	100	61,657	6.00	325.62	337.65	281.22
36½	39	32½	39¼	24¾	36	18¼	9,500	53,800	Freeport Sulphur	10	796,380	2.00	3.81	2.76	1.87
5⅞	7½	5⅞	10	5½	10⅞	7	8,100	20,000	Gen. Printing Ink	1	735,960	.60	.86	.94	.62
15	15⅜	12¾	19⅝	11	24½	14	9,200	52,100	Glidden Co.	No	829,989	1.00	1.56	1.70	—.29
43	46	40¼	45	30	47	34	900	6,000	4½% cum. pfd.	50	199.940	2.25	8.64	9.27	1.03
81	95	76	113¼	89⅞	112¼	93	2,800	7,700	Hazel Atlas	25	434,409	5.00	5.98	6.60	4.97
70⅛	77½	66	100½	69	101½	63	3,800	26,000	Hercules Powder	No	1,316,710	2.85	4.01	3.65	1.95
126½	128¼	123½	133½	126¼	135½	128⅛	200	2,240	6% cum. pfd.	100	96,194	6.00	66.38	60.87	35.31
22½	26	20¾	29	16⅝	29½	16¾	5,500	31,000	Industrial Rayon	No	759,325	2.00	3.15	1.77	.24
22½	25½	19½	47⅝	21¼	46¼	17½	2,200	11,800	Interchem.	No	290,320	1.60	2.47	4.10	.32
109⅛	113¼	109	113	91	109½	90	290	2,240	6% pfd.	100	65,661	6.00	16.99	24.27	7.39
1⅝	2⅛	1¼	3½	1	3⅝	1½	4,000	26,600	Intern. Agricul.	No	436,048	...	...	—1.32	—0.003
42	49	30⅛	44	18½	41	16	3,200	18,500	7% cum. pfd.	100	100,000	...	...	1.26	7.01
26	28½	23⅜	38⅞	19⅝	55⅝	35	41,100	375,300	Intern. Nickel	No	14,584,025	2.00	2.30	2.39	2.09
42	42½	38¼	39⅝	26⅞	38	29	1,400	6,700	Intern. Salt	No	240,000	2.50	3.98	1.92	2.29
20	20¼	17¾	23¾	14⅝	22½	14½	1,100	5,500	Kellogg (Spencer)	No	509,213	1.60	...	1.39	.71
28	45⅜	26½	53⅝	30	56⅝	36½	17,800	104,200	Libbey Owens Ford	No	2,513,258	3.50	3.97	3.21	1.57
16¼	16⅝	13	18⅝	10½	19	13½	11,400	32,300	Liquid Carbonic	No	700,000	1.00	1.72	1.62	1.81
28¼	30	24¼	32⅝	21	37⅝	20⅝	5,200	22,100	Mathieson Alkali	No	828,171	1.50	1.72	1.12	1.01
82½	88½	77	119	79	114¾	85¾	7,700	40,700	Monsanto Chem.	No	1,241,816	3.00	4.04	3.81	2.35
117	117	112	119	110	121	110	270	1.910	4½% pfd. A.	No	50,000	4.50	57.38	54.29	31.51
119¾	120	115	122	113½	122½	112	160	1,650	4½% pfd. B.	No	50,000	4.50	57.38	54.29	31.51
16⅝	17¾	14½	22⅛	14⅛	27½	17⅞	16,000	97,900	National Lead	10	3,095,100	.87	1.34	1.23	.75
170	176	168½	176	160	173½	152	500	3,000	7% cum. "A" pfd.	100	213,793	7.00	28.54	27.04	20.03
145½	154	142	153¾	132	145	132	170	1,290	6% cum. "B" pfd.	100	103,277	6.00	59.46	55.30	35.97
29	31	26	44	28¾	46	28½	800	15,500	National Oil Products	4	179,829	1.35	3.92	3.89	2.23
6⅝	8¾	5⅝	14¼	6⅛	17¾	8½	11,400	54,400	Newport Industries	1	621,359	.30	.50	.66	—.08
45½	49¼	38¾	64⅝	42	70	50	15.200	91,500	Owens-Illinois Glass	12.50	2,661,204	2.00	2.71	3.17	2.02
57⅞	59	50⅛	71¾	53	66	50⅝	18,900	95.600	Procter & Gamble	No	6,409,418	2.75	4.37	3.80	2.50
115	119½	115	118½	112½	119⅝	112	280	1,590	5% pfd.	100	169,517	5.00	336.78	298.55	101.81
14½	15	10⅛	13⅛	7⅝	17¼	9⅞	15,900	127,400	Shell Union Oil	No	13,070,625	.75	1.05	.77	.70
29	29⅞	18⅞	23¼	12¼	29½	15½	13,600	65,100	Skelly Oil	No	981,349	1.25	3.28	1.99	2.27
30⅛	31	25½	29	20⅝	30	22⅝	62,300	348,600	S. O. Indiana	25	15,272,020	1.50	2.20	2.24	1.82
40¾	40⅝	33	46½	29⅞	53½	38	114,200	791,700	S. O. New Jersey	25	26,618,065	1.75	...	3.27	2.86
8½	9⅛	7⅜	9¼	4¼	9½	4	5,000	33,600	Tenn. Corp.	5	853,696	.25	1.36	.41	.40
39½	40½	34½	47⅝	33	50⅝	32½	50,300	333,400	Texas Corp.	25	10,876,882	2.00	...	3.02	3.13
35¾	38	31½	37¼	26⅞	38½	26	12,300	83,500	Texas Gulf Sulphur	No	3,840,000	2.50	2.38	2.04	1.81
71¼	72⅞	60	88⅝	59⅞	94¼	65½	43,000	254,500	Union Carbide & Carbon	No	9,277,288	2.30	4.55	3.86	2.77
45	50½	40⅞	65⅝	42½	69¼	52	1,800	16,300	United Carbon	No	397,885	3.00	3.36	3.81	3.78
24⅝	28¾	20	28	14	29⅝	13½	4,100	40,700	U. S. Indus. Alcohol	No	391,238	...	...	.20	—1.08
24⅜	34⅛	23	43⅞	25	40	16	10,400	76,600	Vanadium Corp. Amer.	No	377,140	1.50	...	3.25	.61
23⅞	24¾	20	31½	19	29¾	18¼	1,800	9,400	Victor Chem.	5	696,000	1.40	1.45	1.59	1.05
1⅞	2½	1⅛	4⅛	1¾	5¾	2⅛	2,900	16,200	Virginia-Caro. Chem.	No	486,122	...	...	—1.57	—1.80
25¾	27¼	19⅛	31¾	14	33¾	17	5,300	18,500	6% cum. part. pfd.	100	213,052	...	...	3.41	1.90
32	36	27¼	38½	27¾	39¼	15¼	800	7,100	Westvaco Chlorine	No	353,152	1.85	2.96	2.91	1.52
109	110¼	105	109⅞	106	...	...	620	3,540	cum. pfd.	No	60,000	4.50	...	...	...

NEW YORK STOCK EXCHANGE

Last	High	Low	1940 High	1940 Low	1939 High	1939 Low	Sales June 1941	Sales 1941	Stocks	Par $	Shares Listed	Dividends 1940*	1940	1939	1938
38⅞	39	31	39⅞	26	35¾	18⅝	24,600	150,600	Amer. Cyanamid "B"	10	2,618,387	1.10	2.44	2.07	.91
120½	134	107	134⅞	98	112¾	76	1,300	8,725	Celanese, 7% cum. 1st pfd.	100	148.179	9.72	35.25	35.73	8.95
4⅜	5½	4	6¾	3⅝	6¾	3	125	9.125	Celluloid Corp.	15	194.952	...	—.29	.70	—2.73
6⅞	7¾	6¾	8½	5	9¼	5	500	5,300	Duval Texas Sulphur	No	500,000	.75	1.16	1.25	.71
82	85⅝	65	92	60	68	30	675	3,925	Heyden Chem. Corp.	100	125.497	3.00	...	5.98	2.07
78¾	96¼	73	104	65	117	90	7,000	32,700	Pittsburgh Plate Glass	25	2,188,040	5.00	6.30	4.94	3.00
78⅝	80⅛	65	106	62¼	113¾	81	4,450	24,700	Sherwin Williams	25	638.927	3.00	...	5.96	3.43
111	115½	109	114¾	106	116	106½	300	1,910	5% cum. pfd.	50	132,189	5.00	...	35.08	3.76

PHILADELPHIA STOCK EXCHANGE

Last	High	Low	1940 High	1940 Low	1939 High	1939 Low	Sales June 1941	Sales 1941	Stocks	Par $	Shares Listed	Dividends 1940*	1940	1939	1938
166½	182	162	192	158¾	179	135	275	1,875	Pennsylvania Salt	50	150,000	9.00	...	10.52	6.39

NEW YORK STOCK EXCHANGE

Price Range June 1941 Last	June 1941 High	Low	1940 High	1940 Low	1939 High	1939 Low	Sales June 1941	Sales 1941	Bonds	Date Due	Int. %	Int. Period	Outstanding $
102½	104½	100¾	105¼	100⅛	103⅝	98	349,000	1,520,000	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
26¼	35	26⅛	41	27½	41⅛	19	18,000	243,000	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
26½	33½	25⅝	39⅝	27	37	21½	93,000	529,000	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
31	38	31	40	21	30	16	....	3,000	Ruhr Chem.	1948	6	A-O	1,500,000
98½	99¾	94¾	100¼	93½	95¾	88⅝	608,000	2,839,000	Shell Union Oil	1954	2½	J-J	85,000,000
105½	106½	103⅝	107	101¼	106¼	97⅝	309,000	1,133,000	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
105	105⅝	103	107	100⅝	106⅛	94⅛	163,000	1,242,000	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
107	107	102¾	108¼	102	105⅞	95¼	154,000	889,000	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.

Synthetic Organic Chemicals 1940

The United States Tariff Commission has recently made available preliminary statistics of United States production and sales of synthetic organic chemicals in 1940. These data, compiled annually by the Tariff Commission, include production and sales of coal-tar crudes, coal-tar intermediates, finished coal-tar products, dyes, medicinals, flavors and perfume materials, coal-tar resins, and non-coal-tar chemicals. The figures for coal-tar crudes are a combination of the statistics reported to the Bureau of Mines by coke-oven operators who distill tar produced by themselves, and those reported to the Tariff Commission by distillers of purchased tar.

The total sales of synthetic organic chemicals in 1940 were valued at $484,000,000, an increase of 26 per cent. over the 1939 sales which were higher than in any previous year. Sales of synthetic coal-tar chemicals increased from $185,000,000 in 1939 to $218,000,000 in 1940, or 18 per cent., and non-coal-tar chemicals from $200,000,000 to $266,000,000 or 33 per cent.

The groups that advanced most in sales value were coal-tar resins, medicinals, and intermediates. In 1940, as in preceding years, about one-half of the output of intermediates and of non-coal-tar chemicals, and smaller fractions of the other groups, were not sold as such but were consumed by producers in further processing.

The peak activity in both sales and production in 1940 was due largely to improved business, some of which was caused by increased civilian consumption and some indirectly by demands for military purposes. Production for strictly military

United States production and sales of certain miscellaneous synthetic chemical products in 1940.

	Production	Sales		
	Pounds	Pounds	Value	Unit Value
(A) Coal-tar: Total	92,023,290	61,244,418	$13,234,620	$0.22
Biological stains and chemical indicators	9,648	8,585	98,020	11.42
Gases (poisonous, tear, etc.): Total	91,633	104,557	106,868	1.02
Insecticides (synthetic): Total		287,510	77,452	.27
Methyl cyclohexanone		25,696	13,040	.51
Photographic chemicals: Total	1,747,445	1,196,508	1,323,002	1.11
Hydroquinone[1]	1,288,647	935,719	761,748	.81
p-Hydroxy phenyglycine		3,003	8,603	2.86
Methyl p-aminophenol sulfate (Metol) (Rhodol)	330,952	233,371	499,364	2.14
Plasticizers: Total	28,386,357	21,418,155	4,530,095	.21
Phthalates: Total	18,727,424	12,765,297	2,532,705	.20
Dibutyl	8,799,528	5,506,098	947,658	.17
Diethyl	2,306,063	1,869,683	333,167	.18
Textile chemicals	13,175,777	12,751,293	2,792,779	.22
(B) Non-coal-tar: Total	3,919,121,719	1,922,496,117	226,057,971	.12
Acetaldehyde	201,484,831			
Acetic acid (100% purity)	184,884,866			
Acetic anhydride (from all sources) (100% purity)	256,652,339			
Acetone	201,506,334	121,172,975	5,571,188	.05
Amines: Total	1,969,441	1,746,288	927,962	.53
Amyl acetate: Iso (90% purity)	194,757			
Butadiene	369,089	276,554	98,363	.36
Butyl acetates (90% purity): Total	86,721,057	78,864,644	5,903,842	.07
Normal		74,457,452	5,624,323	.07
Butyl alcohols (100% purity): Total	164,568,813	61,313,850	4,621,665	.08
Normal	100,412,850	54,434,432	4,200,248	.08
n-Butyl bromide	4,205			
Carbon tetrachloride	100,811,330	79,674,547	3,093,415	.04
Chloroform (tech. and USP)	3,078,521	2,226,952	415,560	.19
Diacetone alcohol	4,671,512	2,832,591	225,275	.08
Ethyl acetate (85% purity)	75,368,803	60,632,757	3,571,439	.06
Formaldehyde (40% purity)	180,884,573	107,999,713	4,558,666	.04

	Production	Sales		
	Pounds	Pounds	Value	Unit Value
(B) Non-coal-tar (continued):				
Gallic acid, tech.	213,511			
Glyceryl monostearate	172,610	159,973	$40,155	$0.25
Isopropyl alcohol (Isopropanol)	219,925,900	39,673,760	1,563,541	.04
Isopropyl ether		814,449	32,040	.04
Lactic acid:				
Edible (100% purity)		1,492,301	309,324	.21
Technical (100% purity)	1,869,365	1,671,237	212,276	.13
Methanol (synthetic)		159,271,316	5,222,425	.03
Methyl chloride (Chloromethane) (100% purity)	3,041,661	3,123,484	971,882	.31
Oxalic acid	12,921,227			
Plasticizers: Total	8,474,052	6,880,775	2,483,484	.36
Dibutyl tartrate	28,318	26,976	10,305	.38
Pyrogallic acid (Pyrogallol)	68,275	62,767	95,697	1.52
Sulfated fatty alcohols, acids, etc. (Gardinols, Igepons, Intramines, Mapros, Xynomines)	16,201,261	14,782,253	4,021,390	.27

[1] Photographic grade only.

Coal-tar crudes[1]: United States production and sales, in 1940.

			Gallons		
Tar distilled by purchasers thereof[2]:					
Oil-gas tar			5,247,209	$235,766	$0.045
Water-gas tar			41,579,643	1,830,923	.044
Coal tar			317,387,061	16,081,282	.051
Total			364,213,913	$18,147,971	.050

Product		Production Quantity	Sales Quantity	Sales Value	Unit Value
Tar[3]	gals.	673,286,517	350,691,110	$16,051,496	$0.046
Light oil and derivatives:					
Crude light oil	gals.	216,617,985	[3]10,324,670	[3]829,031	.080
Benzol (except motor benzol)	gals.	39,151,941	34,313,297	4,510,620	.131
Motor benzol	gals.	109,226,476	103,422,653	8,846,592	.086
Toluol, crude and refined	gals.	32,579,649	31,384,746	7,833,756	.250
Solvent naphtha, crude and refined	gals.	10,060,152	9,267,528	1,754,879	.189
Xylol[3]	gals.	5,645,993	5,335,574	1,239,603	.232
Other light oil products	gals.	8,026,313	5,871,638	562,949	.096
Naphthalene, crude (solidifying under 79°C.)[4]	lbs.	159,710,939	145,987,895	2,921,146	.020
Pyridine, crude and refined[3]	gals.	241,075	218,165	296,441	1.359
Creosote oil	gals.	125,483,027	114,042,003	13,761,521	.121
Coal-tar sold or consumed in coal-tar solution[2]	gals.	4,215,152			
Tars, crude and refined[2]	gals.	31,884,610	32,377,588	2,003,097	.062
Tars, road[2]	gals.	150,523,083	152,737,701	10,511,926	.069
Other distillates[5]	gals.	52,034,404	14,485,972	2,183,057	.151
Pitch of tar	tons	707,082	391,741	4,988,049	12.73
Pitch of tar coke[2]	tons	90,906	87,177	1,009,219	11.58
Total				$79,908,661	

[1] Data for coke ovens reported to Bureau of Mines, and for tar refineries and others, to the U. S. Tariff Commission unless otherwise noted.
[2] Reported to U. S. Tariff Commission only.
[3] Reported to Bureau of Mines only.
[4] Includes refined naphthalene reported to Bureau of Mines.
[5] Includes crude tar acids and pyridine reported to the U. S. Tariff Commission and phenol, sodium phenolate, and certain other products reported to Bureau of Mines.

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Synthetic Organic Chemicals, 1940

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uses, however, did not constitute a substantial portion of the 1940 output of synthetic organic chemicals. Other factors influencing production were the building up of inventories by both consumers and producers and an increase in exports together with a decrease in imports of organic chemicals.

An increase in coke-oven operations in 1940 brought about an increase of 21.5 per cent. in the output of coal-tar above the amount produced in 1939, or from 554,000,000 gallons to 673,000,000 gallons. Tar distilled by the purchasers thereof increased from 335,000,000 gallons in 1939 to 364,000,000 gallons. Coal-tar crudes, obtained from coal tar, are the basic raw materials from which the synthetic coal-tar chemicals are manufactured; these increased in output 32 per cent. in 1940 over 1939. Among the crudes showing large gains were toluol, benzene, and crude naphthalene.

Production of coal-tar dyes in 1940 was 128,000,000 pounds or about 8,000,000 pounds over that of 1939, the 92 per cent. increase in exports of synthetic coal-tar chemicals contributing to the improvement. A comparison of production and sales of dyes by classes of application in 1940 indicates only small changes.

Production of coal-tar resins in 1940 reached 223,000,000 pounds, or 24 per cent. more than was produced in 1939; non-coal-tar resin production was 54,000,000 pounds, or 60 per cent. over the 1939 output, the highest previous output of resins on record. Of the alkyd resin, maleic anhydride resins increased slightly in output, and phthalic anhydride resins increased from 70,000,000 pounds to 97,000,000 or about 30 per cent. There was a decline in the output of cresol or cresylic acid resins and phenolic resins for casting. Phenolic resins for molding, however, increased from 19,000,000 pounds to 26,000,000, or 36 per cent. The output of urea resins increased from 16,600,000 pounds to 21,500,000 pounds (30 per cent).

The amount of synthetic chemicals used in the rubber industry, particularly in the manufacture of tires, increased in 1940. The output of miscellaneous synthetic chemicals, which include all unrelated commodities and groups thereof not subject to specific classification, also was greater in 1940 than in 1939. The production of miscellaneous coal-tar chemicals rose from 70,000,000 pounds in 1939 to 92,000,000 pounds in 1940 while that of non-coal-tar miscellaneous chemicals rose 1,000,000,000 pounds—from 3,000,000,000 pounds to 4,000,000,000 pounds. Among the non-coal-tar chemicals showing large increases in output were acetic acid, acetic anhydride, butyl alcohol, carbon tetrachloride, ethyl acetate, formaldehyde, methanol, and isopropyl alcohol.

(To be Continued)

Comparison of United States production and sales of dyes, by classes of application, average 1934-38, annual 1939 and 1940.

(In thousands)

Class of application	Production: Quantity 1934-38 average Pounds	1939 Pounds	1940 Pounds	Percent of total 1934-38 average	1939	1940
Acetate silk	1,961	2,585	2,548	1.9	2.2	2.0
Acid	13,849	17,700	17,179	13.5	14.7	13.5
Azoic	[1] 1,077	3,318	3,629	1.1	2.8	2.8
Basic	5,149	6,415	6,926	5.0	5.3	5.4
Direct	25,780	31,438	32,863	25.1	26.2	25.8
Lake and spirit-soluble	2,765	3,305	3,883	2.7	2.7	3.0
Mordant and chrome	5,262	5,237	6,957	5.1	4.4	5.4
Sulfur	16,619	18,651	21,561	16.2	15.5	16.9
Vat, total	29,234	30,035	30,076			
(a) Indigo	15,378	12,475	11,133	15.0	10.4	8.7
(b) Other	13,856	17,560	18,943	13.5	14.6	14.8
Unclassified	831	1,506	2,212	.9	1.2	1.7
Total	102,527	120,190	127,834	100.0	100.0	100.0

Class of application	Sales: Quantity 1934-38 average Pounds	1939 Pounds	1940 Pounds	Percent of total 1934-38 average	1939	1940
Acetate silk	1,716	2,402	2,481	1.7	2.1	2.0
Acid	13,501	17,063	15,937	13.4	14.9	13.0
Azoic	[1] 996	3,145	3,533	1.0	2.7	2.9
Basic	4,878	5,976	6,235	4.8	5.2	5.1
Direct	25,261	30,421	30,626	25.0	26.6	25.0
Lake and spirit-soluble	2,612	3,278	3,538	2.6	2.9	2.8
Mordant and chrome	5,080	5,325	6,230	5.0	4.7	5.1
Sulfur	17,070	17,311	21,016	16.9	15.1	17.1
Vat, total	29,204	28,135	31,038			
(a) Indigo	15,510	11,949	12,009	15.3	10.4	9.8
(b) Other	13,694	16,186	19,029	13.5	14.1	15.5
Unclassified	819	1,438	2,043	.8	1.3	1.7
Total	101,137	114,494	122,677	100.0	100.0	100.0

[1] Two-year average.

(In thousands)

Class of application	Sales: Value 1934-38 average	1939	1940	Percent of total 1934-38 average	1939	1940
Acetate silk	$1,934	$2,211	$2,293	3.5	3.2	3.0
Acid	10,509	13,296	13,072	19.0	18.9	17.1
Azoic	[1] 1,664	4,708	5,164	3.0	6.7	6.7
Basic	4,421	5,593	5,707	8.0	8.0	7.5
Direct	13,685	16,649	17,198	24.8	23.7	22.5
Lake and spirit-soluble	1,794	2,298	2,675	3.3	3.3	3.5
Mordant and chrome	2,481	2,665	3,286	4.5	3.8	4.3
Sulfur	3,880	4,657	5,348	7.0	6.6	7.0
Vat, total	14,107	16,789	19,810			
(a) Indigo	2,609	1,843	1,880	4.7	2.6	2.5
(b) Other	11,498	14,946	17,930	20.8	21.3	23.4
Unclassified	752	1,358	1,879	1.4	1.9	2.5
Total	55,227	70,224	76,432	100.0	100.0	100.0

[1] Two-year average.

United States production and sales of certain synthetic resins in 1940.

	Production Pounds	Sales: Pounds	Value	Unit Value
(A) Coal-tar: Total	222,943,118	153,520,805	$33,378,406	$0.22
Alkyd resins:				
Maleic anhydride	6,476,883	5,418,875	1,008,835	.19
Phthalic anhydride	91,446,195	42,400,005	7,774,730	.18
Coumarone and indene	24,131,733	22,976,705	1,576,907	.07
Derived from tar acids:				
Cresols or cresylic acid	11,978,763			
Phenol:				
For casting	6,953,103	6,696,008	3,175,589	.47
For molding	26,417,693	25,117,472	7,869,678	.31
For other uses	26,957,636	24,234,563	4,822,729	.20
Phenols and cresols	21,126,005			
(B) Non-coal-tar: Total	53,871,245	47,578,845	25,989,933	.55
Urea	21,491,653	19,300,685	7,445,483	.39

United States production and sales of certain rubber chemicals in 1940.

	Production Pounds	Sales: Pounds	Value	Unit Value
(A) Coal-tar: Total	37,139,394	28,024,769	$13,599,760	$0.49
Accelerators, total	16,736,874	12,998,019	6,370,558	.49
Butyraldehyde aniline	482,964			
Diphenylguanidine	1,448,504	1,279,701	427,086	.33
Mercaptobenzothiazole	5,438,933			
Thiocarbanilide	404,838			
Antioxidants, total	20,402,520	15,026,750	7,229,202	.48
Diphenyl-p-phenylenediamine	1,281,841			
(B) Non-coal-tar: Total	16,915,139	15,353,009	3,747,437	.24
Accelerators:				
Tetramethylthiouram sulfide and disulfide	567,517	433,397	935,328	2.16
Zinc diethyl dithiocarbamate	51.775			

New Trade Marks of the Month

ARCHER-DANIELS-MIDLAND CO. PURE CLARIFIED RAW OIL MINNEAPOLIS.
388,154

KWIK
388,337

COLLIER C
388,347

PRICE WEIGHT
412,040

BARIUM X A
429,759

USITE
429,760

ERCOSOL
429,887

AMPHENOL
430,937

RC
431,740

"DUXBAK"
436,001

CALTEX
438,037

ALADDIN
438,964

PROTOZYME
439,630

LEAFLEX
439,831

SALYSAL
440,174

RAIN SHINE
440,300

FLORITE
440,717

HI-FLORITE
440,718

Stripolith
440,744

Panolith
440,856

IRVIN
440,992

MACITE
441,025

KEMI-KLOTH
441,162

"PED-O-SAV"
441,375

Morlotan
441,505

HEMP
441,527

LUTEOGEN
441,569

Victory ROX-SALVE
441,577

PYNAMITE
441,620

Pessa-Jell
441,758

METASOL
441,883

ferti·lome
441,905

GO-WAC-CO
441,906

GOLDEN WAX CLEANSER
441,907

"KLEANVAK"
441,908

COMPOUND"M"
441,913

PENTAPLEX
441,980

MINICOTE
442,064

LUBINOL
442,073

BROADCAST
442,127

ALOLOID
442,334

HAZZI
442,350

CETRO-CIROSE
442,380

AMFRIN
442,405

Trade Mark Descriptions

388,154. Archer - Daniels - Midland Co., Minneapolis, Minn.; Sept. 12, '40; for soybean and linseed oils for use in paints, enamels, and varnishes; since Feb. '28.

388,337. Jakob L. Schiff (The Chemical Products Co.) Baltimore, Md.; Feb. 23, '40; for paints and varnish remover; since Feb. 13, '39.

388,347. Hercules Powder Company, Wilmington, Del.; Aug. 24, '40; for dynamites; since Feb. 29, '32.

412,040. Oneida Paper Products, Inc., New York, N. Y.; Oct. 25, '38; for bags of paper, glassine; cellophane; since Oct. 20, '38.

429,759. Barium and Chemicals, Inc., Willoughby, O.; Mar. 20, '40; for composition employed in conditioning of steel; since Aug. 1, '39.

429,760. Barium and Chemicals, Inc., Willoughby, O.; Mar. 20, '40; for mixture of argillaceous and carbonaceous materials for blanketing and insulating purposes in the sink heads of ingot molds; since Apr. 7, '30.

429,887. E. Rabinowe & Co., Inc., Yonkers, N. Y.; Mar. 23, '40; for alcohol solvent sold for use in paints; since 1929.

430,937. American Phenolic Corporation, Chicago, Ill.; Apr. 19, '40; for synthetic resins; since June 1, '40.

431,740. Roosevelt Oil Co.; Mount Pleasant, Mich.; May 9, '40; for petroleum and products of petroleum;; since Mar. 15, '40.

436,001. Candy and Company, Inc., Chicago, Ill.; Sept. 16, '40; for polishing wax compound; since Sept. 7, '40.

438,035. California Texas Oil Co., Ltd., New York, N. Y.; Nov. 19, '40; for asphaltic products; since Mar., '37.

438,037. California Texas Oil Company, Ltd., New York, N. Y.; Nov. 19, '40; for paint and varnish thinners; since Nov., '37.

438,964. Standard Oil Development Company, Linden, N. J.; Dec. 17, '40; for cementitious adhesive or binder for paper, cloth, and glass and adhesive sealing substances for containers; since Aug. 2, '40.

439,630. Protozyme Laboratories, Inc., Detroit, Mich.; Jan. 13, '41; for preparation for intravenous injection for use in the treatment of locomotor ataxia (tabes dorsalis) since Jan., '26.

439,831. Roxalin Flexible Lacquer Company, Inc., Elizabeth, N. J.; Jan. 21, '41; for aluminum powder in dry and paste form, aluminum mixing lacquers and varnishes and thinners therefore, sold both separately and combined; since Apr., '32.

440,174. Rare Chemicals, Inc., Flemington, N. J.; Jan. 31, '41; for salicylic-acid ester of salicylic acid; since Apr. 8, '20.

440,300. Stephen Wojnowski (Rain-O-Shine) Chemical Co., Highland Park, Mich.; Feb. 4, '41; for oil paint; since Jan. 1, '41.

440,717. Floridin Company, Warren, Pa.; Feb. 17, '41; for absorbents prepared from natural earth; since Dec. '39.

440,718. Floridin Company, Warren, Pa., Feb. 17, '41; for absorbents prepared from natural earth; since Dec. '39.

440,744. Du Pont Film Manufacturing Corp., New York, N. Y.; Feb. 18, '41; for sensitized photographic film; since Jan. 27, '41.

440,856. Du Pont Film Manufacturing Co., New York, N. Y.; Feb. 21, '41; for sensitized photographic film; since Jan. 30, '41.

440,992. Irving M. Merdinger, New York, N. Y.; for cleaning compounds; since July 3, '39.

441,025. Manufacturers Chemical Corp., Jersey City, N. J.; Feb. 26, '41; for cellulose acetate plastic moulding materials; since Oct. 1, '40.

441,162. The Haag Laboratories, Inc., Chicago, Ill.; Mar. 3, '41; for chemically treated polishing cloths; since Jan., '41.

441,375. Alan W. Ross (Ped-O-Sav Co.), Montclair, N. J.; Mar. 8, '41; for preparation for the treatment of athlete's foot or other infections; since Feb. 20, '41.

441,410. Florence Greene Piper, Los Angeles, Calif.; Mar. 10, '41; for creme for the feet; since July 1, '34.

441,505. The Drug Products Co., Inc., Long Island City, N. Y.; Mar. 13, '41; for medicinal skin ointment; since May 28, '37.

441,527. Union Bag & Paper Corp., New York, N. Y.; Mar. 13, '41; for paper bags; since Jan. 1, '20.

441,758. Robert Alexander Bachmann (Bach Products Co) New York, N. Y.; Mar. 21, '41; for lubricating jelly for anatomical, clinical, gynecological, medical, obstetrical, otological and surgical application; since Feb. '39.

441,569. Difco Laboratories, Inc., Detroit, Mich.; Mar. 15, '41; for pharmaceutical preparation; since Feb. 10, '41.

441,577. Roch D. Kawerk (Victory Chemical Co.) Birmingham, Ala.; Mar. 15, '41; for salve useful in the treatment of head and chest colds, nasal congestion, and as an antiseptic dressing for minor cuts or insect bites; since Nov. 3, '37.

441,620. The Morton S. Pine Company, Cleveland, O.; Mar. 17, '41; for liquid detergent; since Jan. 1, '40.

441,883. Fred'k A. Stresen-Reuter, Inc., Chicago, Ill.; Mar. 24, '41; for liquid, paste, and solid metallic soaps used as a drier in the manufacture of paints, paint oils and varnishes; since Jan. 1, '38.

441,905. Fidelity Chemical Corp., Houston, Texas; Mar. 25, '41; for complete mixed fertilizer; since Apr., '38.

441,906. Golden Wax Cleanser Co., Clarksville, Tenn.; Mar. 25, '41; for liquid metal polish; since Mar. 17, '41.

441,907. Golden Wax Cleanser Co., Clarksville, Tenn.; Mar. 25, '41; for general household cleaning compound; since Jan., '29.

441,908. Golden Wax Cleanser Co., Clarksville, Tenn.; Mar. 25, '41; for cleaner for rugs and textile fabrics; since Jan. '35.

441,913. The Johnson-March Corp., New York, N. Y.; Mar. 25, '41; for wetting agent, more particularly for use in the wetting of dust; since July 13, '40.

441,980. Smith, Kline & French, Laboratories, Phila., Pa.; Mar. 26, '41; for general tonic; since Mar. 18, '41.

442,064. Guardswell Paint Mfg. Co., Des Moines, Iowa; Mar. 29, '41; for paint in paste form; since June 10, '40.

442,073. Purepac Corp., New York, N. Y.; Mar. 29, '41; for medicinal mineral oil; since Jan., '37.

442,127. Great Lakes Varnish Works, Inc., Chicago, Ill.; Mar. 31, '41; for paint enamel; since Feb. 4, '41.

442,334. The Reserve Research Company, Cleveland, O.; Apr. 5, '41; for medicinal preparation comprising finely dispersed colloid of aluminum hydrozide with mineral oil emulsion; since Jan. 2, '40.

442,350. Joe Brasci (Joe Brasci & Co.) Los Angeles, Calif; Apr. 7, '41; for preparation for eradicating Johnson grass and roots; since Mar. 7, '41.

442,380. John Wyeth & Brother, Inc., Phila., Pa.; Apr. 7, '41; for sedative expectorant; since Mar. 12, '41.

442,398. S. L. F. Sales & Service Corp., New York, N. Y.; Apr. 8, '41; for cleaning fluid for use on stone, tile, concrete, or marble; since Jan. 30, '41.

New Trade Marks of the Month

BENZOCARB
442,480

THERMO-LAC
442,499

Ultra
442,518

V & I
442,556

MANAL
442,600

VIGORIZED
442,649

HEN-CEN-MIX
442,728

Synfirna
442,731

VELVETONE
442,751

VITAMILES
442,796

Paralene
442,798

AIR-KING
442,808

SQUADRON
442,809

ARCY SUPERPAX
442,815

KODAK
442,831

ORTHO
442,850

CLAROPHANE
442,874

NOXON
442,915

BAXAMIN
442,926

FURNATEX
442,986

SYNTONE
443,027

VELVACAST
443,084

443,115

CARBALLOY
443,134

HEMACAPS
443,166

WHITE CAP
443,184

Kaquasyn
443,186

VULKSEAL
443,262

KONTOL
443,263

SECUROIL
443,329

MORFLEX
443,438

TEPRIN
443,561

CALBERON
443,645

CALBERON
443,646

(Trade Mark Descriptions Continued)

442,405. Amfre Drug Co., Inc., New York, N. Y.; Apr. 9, '41: for pharmaceutical preparation as a hypnotic sedative; since Mar. 1, '41.

442,480. The Benzocarb Co., Baltimore, Md.; Apr. 11, '41; for ointment to be applied externally for the relief of eczema and eczematous conditions; since Mar. 20, '40.

442,499. The Sherwin-Williams Company, Cleveland, O.; Apr. 11, '41; for lacquer and varnishes; since May 21, '41.

442,518. Chemurgic Corp., Richmond, Calif.; Apr. 12, '41; for insecticides; since Mar. 27, '41.

442,556. D. Jayne & Son, Inc., Phila., Pa.; Apr. 14, '41; for medicinal preparations comprising vitamins and iron; since Mar. 15, '41.

442,600. Ohio Ferro-Alloys Corp., Philo, O.; Apr. 15, '41; for ferro-aluminum manganese alloys; since Nov. 12, '40.

442,649. The Canfield Oil Co., Cleveland, O.; Apr. 17, '41; for motor oil; since Mar. 27, '41.

442,728. Sea Board Supply Co., Inc., Phila., Pa.; Apr. 18, '41; for feed concentrate for poultry; since Jan. '41.

442,731. H. Schoppe & Schultz, Hamburg, Germany; Apr. 18, '41; for preparation used in the manufacture of ice cream as a binding agent, preserving agent, and flavoring agent; since Apr. 29, '40.

442,751. The Griffith Laboratories, Inc., Chicago, Ill.; Apr. 19, '41; for powdered product containing essentially debittered soya bean grits, with and without corn grits and with and without dextrose, for use as a filler, binder, or emulsifier for fillings for encased meats and other ground meat products; since Feb. 15, '37.

442,796. Miles Laboratories, Inc., Elkhart, Ind.; Apr. 21, '41; for vitamin tablets; since Apr. 11, '41

442,798. Paralene Products, Inc., New New York, N. Y.; Apr. 23, '41; for cellulose cleansing cream; since Sept., '40.

442,808. Sunset Oil Company, Los Angeles, Calif.; Apr. 21, '41; for petroleum products—namely, gasoline; since Apr. 7, '41.

442,809. Sunset Oil Company, Los Angeles, Calif.; Apr. 21, '41; for petroleum products—namely, gasoline; since Apr. 3, '41.

442,815. William R. C. Windsor (Arcy Mfg. Co.) New York, N. Y.; Apr. 21, '41; for asbestos packing for stuffing boxes; since Mar. 8, '34.

442,831. Eastman Kodak Company, Jersey City, N. J., and Rochester, N. Y.; Apr. 22, '41; for adhesive or binding tape; since July 3, '40.

442,850. Ortho Products, Inc., Linden, N. J.; Apr. 22, '41; for vaginal creams and jellies; since Mar. 21, '41.

442,874. Oneida Paper Products, Inc., New York, N. Y.; Apr. 23, '41; for cellulose film, glassine, or paper bags, which are sold in trade empty; since Apr. 9, '41.

442,915. Leopoldine Notterbaum, Newark, N. J.; Apr. 24, '41; for cleaner and polish for metals, glass and porcelain; since Oct. 3, '12.

442,926. William J. Wardall, New York, N. Y.; Apr. 24, '41; for vitamin product containing all of the present known vitamins; since Apr. 9, '41.

442,986. Binney & Smith Company, New York, N. Y.; Apr. 26, '41; for carbon black for use in the rubber industry; since Dec. 17, '40.

443,027. United States Rubber Co., New York, N. Y.; Apr. 26, '41; for insecticidal spray for the killing of insects; since July 9, '40.

443,084. Georgia Kaolin Company, Elizabeth, N. J.; for clay used in the body composition of ceramic ware; since Mar. 1, '41.

443,115. Chemurgic Corp., Richmond, Calif.; Apr. 30, '41; for insecticides; since Mar. 27, '41.

443,134. The Pharis Tire and Rubber Company, Newark, Ohio.; Apr. 30, '41; for rubber and rubber containing pneumatic tires and tubes for vehicle wheels; since Apr. 16, '41.

443,166. The Maltine Company, New York, N. Y.; May 1, '41; for pharmaceutical preparation, more particularly vitamin and iron capsules; since Feb. 3, '41.

443,184. Chlorine Solutions, Inc., Los Angeles, Calif.; May 2, '41; for bleaching fluid; since May 1, '30.

443,186. The Drug Products Co., Inc., Long Island, N. Y.; May 2, '41; for vitamin K synthetic substance in water; since Mar. 4, '41.

443,262. Oliver Tire & Rubber Company, Oakland, Calif.; May 5, '41; for compounded rubber preparation used in making and repairing tires; since Dec. 1, '40.

443,263. Petrolite Corp., Ltd., Webster Groves, Mo.; May 5, '41; for compounds for the treatment and refining of petroleum; since Apr. 16, '37.

443,329. Investo Company, Los Angeles, Calif.; May 7, '41; for liquid filters and parts thereof particularly adapted for use in purifying lubricating oils; since Mar. 12, '41.

443,438. Swift and Co., Chicago, Ill.; May 9, '41; for glue; since Mar. 29,'41.

443,561. Endo Products, Inc., New York, N. Y.; May 14, '41; for preparation consisting of an anti-asthmatic tablet; since May 1, '41;

443,645. Scott & Bowne, Bloomfield, N. J.; May 16, '41; for the prophylaxis of nutritional disorders due to deficiencies of calcium, phosphorus, iron and vitamin B_1; since Apr. 4, '41.

443,646. Scott & Bowne, Bloomfield, N. J.; May 16; for the prophylaxis of nutritional disorders due to deficiencies of calcium, phosphorus, iron and vitamin B_1.

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A Complete Check-List of Products, Chemicals, Process Industries

Cellulose

Process for the manufacture of lower fatty acid esters of cellulose. No. 2,244,855. George Schneider to Celanese Corp. of Amer.
Process of preparing mixed esters of cellulose containing dicarboxylic acid groups. No. 2,245,208. Carl J. Malm and Carlton L. Crane to Eastman Kodak Co.
Cellulose derivative compositions containiing butyl butoxyacetate. No. 2,245,233. Henry B. Smith to Eastman Kodak Co.
Method of producing moldable lignocellulose and product thereof. No. 2,247,204. Arlie W. Schorger and John H. Ferguson to Burgess Cellulose Co.
Molded lignocellulosic products and methods of making and treating same. No. 2,247,205 to 2,247,209. Arlie W. Schorger and John H. Ferguson to Burgess Cellulose Co.
Thermoplastic lignin obtained by extracting a treated natural lignocellulose with a neutral organic solvent for lignin and evaporating the solvent. No. 2,247,210. Arlie W. Schorger to Burgess Cellulose Co.

Ceramics and Refractories

Method of forming refractory materials comprises mixing stannic oxide with small amount of a copper containing compound, molding said mixture under pressure into a body of desired shape and sintering said body. No. 2,244,777. Harrison P. Hood to Corning Glass Works.
Process and apparatus for producing cylindrical ceramic tile. No. 2,245.181. Charles N. Brooks.
Burned refractory composition comprising basic constituents magnesia and 21-35% of lime and acid constituents including silica and a small amount of a stabilizing oxide the basic and acid constituents being in chemically effective base-acid ratio between 2.23 and 2.77 to form calcium silicates of which tri-calcium silicate is predominant and burned at a temperature rendering the product substantially nonhydrating. No. 2,245,297. Norman P. Pitt, Arthur C. Halferdahl and Frank E. Lathe to Canadian Refractories Ltd.
Process of surfacing glass plates. No. 2,245,473. Norbert S. Barbisch.
A lead glass comprising about forty to sixty per cent of lead oxide, fifteen to thirty per cent of silica, one per cent of aluminum oxide and a small amount not exceeding about three percent of alkali oxides said glaze having a firing temperature and coefficient of expansion adapting it for fusion to glass electric lamp envelopes. No. 2,245,541. Raymond W. Goodwin to General Electric Co.
Method of coloring fibers composed of glass containing a first group metal which includes treating them with an ionizable salt of a metal of a higher group to displace a portion of the said first group metal and subsequently reacting the higher group metal with an additional material containing an ion capable of forming a pigment therewith, whereby a pigment is formed and incorporated within the fibers. No. 2,245,783. James Franklin Hyde to Owens-Corning Fiberglas Corp.
Method of manufacturing glass rope. No. 2,245,824. Rudolph G. Roesch to The Eraser Co., Inc.
An enamel yielding substantially non-yellowed films upon baking. No. 2,246,095. Stuart Graves to E. I. du Pont de Nemours & Co.
A batch mixture for forming refractory bodies comprising a refractory grog and a bonding mix for bonding the same, said mix comprising a high alumina hydraulic cement and a crystalline fused aluminum oxide towards which the cement is reactive at ordinary ceramic temperatures to form a refractory bond having a higher melting point than the hydraulic cement, the proportions of the bonding mix being approximately 50% cement and 50% aluminum oxide. No. 2,246,226. Samuel F. Walton to The Exolon Co.
Process of making cement. No. 2,246,253. Herbert B. Johnson to Ritter Products Corp.
A heat-hardened homogeneously mixed, ceramic body comprising a quantity of coal ash dust particles, a quantity of Cobrecite, and a quantity of binder consisting of an intermixture of clay dust and water. No. 2,247,120. James A. Fitzgerald.
Enamel free from lead and having a firing temperature and coefficient of expansion adapting it for application to the surfaces of glass electric lamp envelopes comprising about 8-20% SiO_2 4-12% Sb_2O_5 1-2% Al_2O_3 0-6% ZrO, Ba and ZnO in a combined amount of about 12-18% 0-2% CaO, 0-5% CdO, 3-6% CaF_2, 0-2% Na_2SiF_6, 2-10% alkali oxides and 30-45% B_2O_3. No. 2,247,196. Raymond W. Goodwin to General Electric Co.
Process of producing a basic refractory brick covered by oxidizable metallic spacer plates in a mold. No. 2,247,376. Russell P. Heuer to General Refractories Company.
Investment composition for casting precious metals and their alloys, consisting principally of a siliceous refractory material and a calcium sulfate binder in such proportions as to give a dental investment composition and containing from .1 to 2.0 per cent strontium chloride. No. 2,247,395. Robert Heiman to The Columbus Dental Manufacturing Co.
Asbestos and cement composition and method of making. No. 2,247,-453. Thomas I. Taylor.
Process of treating clays. No. 2,247,467. George J. Barker and Emil Truog to Wisconsin Alumni Research Foundation.
Investment composition for casting precious metals and their alloys, consisting principally of a siliceous refractory material and a calcium sulfate binder in such proportions as to give a dental infestment composition and containing from .1 to 2.0 per cent zinc chloride. No. 2,247,572. Paul F. Collins to Edmund A. Steinbock.
Investment composition for casting precious metals and their alloys, consisting principally of a siliceous refractory material and a calcium sulfate binder in such proportions as to give a dental investment composition and containing from .1 to 2.0 per cent zinc chloride. No. 2,247,573. Paul F. Collins to Edmund A. Steinbock.
Investment compositions for casting dental alloys. No. 2,247,585-588. Robert Neiman to Edmund A. Steinbock.
Manufacture of cements from calcium sulfate and blast furnace slag. No. 2,248,032. John S. Dunn and Victor Lefebure to Imperial Chemical Industries, Ltd.
Manufacture of cements from calcium sulfate and blast furnace slag. No. 2,248,033. Nelson E. Vallace and Victor Lefebure to Imperial Chemical Industries, Ltd.

Chemical Specialty

A repellent for ambrosia beetles comprising an N-alkylated alkylene polyamine or a salt thereof. No. 2,244,712. Lucas P. Kyrides to Monsanto Chemical Co.
Detergent composition and method of making same. No. 2,244,721. Waldemar O. Mitscherling to John J. O'Connor.
Liquid cleaning composition. No. 2,245,052. Paul A. Salz.
Manufacture of molded compositions for brake linings or similar articles. No. 2,245,203. Joseph N. Kuzmick to Raybestos-Manhattan, Inc.
Etching solution containing about 95 parts of a 20% by weight cupric sulfate $CuSO_4 5H_2O$ solution 5 parts of a 35% by weight niter cake solution and a trace of material for reducing surface adhesion. No. 2,245,219. Alexander Murray to Eastman Kodak Co.
Method of manufacturing dried starch conversion products. No. 2,245,-309. James F. Walsh to American Maize-Products Co.
Concentrated vitamin D in evaporated milk and process of producing same. No. 2,245,418. Reginald C. Sherwood and Charles G. Ferrari to General Mills, Inc.
A plaster material obtained by mixing with lime a finely comminuted mineral antigorite and sulfur. No. 2,245.458. Homer P. Brown.
Process for the manufacture of meerschaum for smokers' articles comprising intermixing ground magnesium silicate with the white of eggs. No. 2,245,489. Floyd L. Martin.
An internal remedy for poultry and creatures subject to worms comprising an alkaloid substance having nitrogen in quaternary form and areca nut. No. 2,245,530. Orley J. Mayfield and Jack P. Henry to Dr. Salsbury's Labs.
Improvement in the art of protecting and preserving food products which consists in applying to the exposed surfaces thereof a jelly like coating containing as an active ingredient a metal pectinate toxic to bacteria. No. 2,245,576. Arnold C. Dickinson and Philip B. Byers to Sardik, Inc.
Binder for glass fiber threads and the like, comprising a diluted aqueous emulsion containing 3 to 10% emulsifying agent, 3 to 10% of emulsive substance selected from the group consisting of oil, fats and wax, and 3 to 10% dextrine. No. 2,245,620. Hans Steinbock to Owens Corning Fiberglas Corp.
Method of treating meat which comprises removing muscles from the skeletal structure during rigor mortis. No. 2,245,631. Beverly E. Williams and Leon L. Cadwell to Industrial Patents Corp.
A steam turbine lubricant consisting of 50 parts of chlorinated diphenyl and 50 parts of a triaryl phosphate. No. 2,245,649. Amerigo F. Caprio to Celluloid Corp.
Method of coating molds which comprises applying to the mold surface a liquid mixture composed of an oil and a solution of a condensed benzene ring compound derived from coal tar, and burning said liquid mixed with a carbon depositing flame. No. 2,245,651. James R. Craig and Charles W. Swartout to The Linde Air Products Co.
Treatment of pineapple and other plants to expedite the formation of buds and the development of fruit thereon which comprises spraying the plants with a material comprising a liquid carrying medium containing bentonite and an unsaturated hydrocarbon selected from the group consisting of acetylene and ethylene. No. 2,245,867. Ferdinand P. Mehrlich to Hawaiian Pineapple Company, Ltd.
Wax modifying agent. No. 2,246,311. Eugene Lieber and Martin M. Sadlon to Standard Oil Development Co.
Water-resistant glue and method of making the same. No. 2,246,405. John R. Hubbard to Peter Cooper Corp.
Treatment of mold surfaces. No. 2,246,463. Louis D. Garratt to Industrial Colloids Co.
Germicide selected from group of compounds consisting of N-alkylated alkylene polyamines and salts thereof with acids. No. 2,246,524. Lucas P. Kyrides to Monsanto Chemical Co.
Buffing compound comprising finely divided abrasive material and a binder therefor of sterin pitch, said pitch being the residue remaining after the hydrogenation and distillation of animal or vegetable fats to remove stearic acid and glycerides. No. 2,246,554. Robert V. Twyning to J. C. Miller Co.
Oil filter block composition. No. 2,247,377. Rolo D. Hill ½ to Guy S. Tucker.
Method of preparing corned beef which comprises applying to a beef cut a wrapper of pork caul fat, injecting a curing agent into the wrapped beef and subjecting the product to curing by submerging in a curing pickle. No. 2,247,425. Beverly E. Williams to Industrial Patents Corp.
Means for controlling evaporation of odor blocks. No. 2,247,600. Frank C. Brennan, John S. Brennan and Lester J. Reysa to J. S. Costello & Son Brush Co.

Coal Tar Chemicals

Process for the manufacture of hydrocarbons from carbon monoxide and hydrogen. No. 2,244,710. Herbert Kolbel to Koppers Co.
Process for removal of acidic impurities from fuel gas. No. 2,244,731. Adolf Schmalenbach to Koppers Co.
Method of oxidizing sterolic compounds and products obtained thereby. No. 2,244,968. Erwin Schwenk and Bradley Whitman to Schering Corp.
Process for producing 4-hydroxy-1-aminonaphthalene-8-carboxylic acid and 4-hydroxynaphthostyril. No. 2,245,172. Werner Zerweck and Wilhelm Kunze to General Aniline & Film Corp.
Process for the manufacture of hydroxyaryl-aminomethyl ketones. No. 2,245,282. Helmut Legerlotz to Ciba Pharmaceutical Products, Inc.
Preparation of sulfanilamidopyridines. No. 2,245,292. Elmore H. Northey and Martin E. Hultquist to American Cyanamid Co.
Acid halides of the Δ-5-6 cyclopentanodimethyl-polyhydro-phenanthrene carboxylic acids-17. No. 2,245,299. Tadeus Reichstein to Roche-Organon, Inc.
Production of carbonyl compounds. No. 2,245,377. Walter Ziese to General Aniline & Film Corp.
Process for the manufacture of allyl-β-tocopherol, comprising reacting allyl halide with β tocopherol in the presence of an acid condensing agent. No. 2,245,480. Paul Karrer to Hoffman-LaRoche Inc.
Method of quenching fluid coked petroleum residue and apparatus for carrying out the method. No. 2,245,549. Frank B. Allen to The Allen-Sherman-Hoff Co.
Halogeno-carboxylic amides. No. 2,245,593. Morris B. Katzman to The Emulsol Corp.
Process of preparing organic compounds which comprises reacting organic compounds in the presence of a Friedel-Crafts catalyst while at least one of the reactants is dissolved in liquid sulfur dioxide. No. 2,245,721. John Ross, Robert L. Brandt and Joseph H. Percy to Colgate-Palmolive-Peet Co.
In process of preparing glyoxal the step which comprises heating 1 mol of glyoxal-tetracetate with at least 4 mols of an aliphatic mono-

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hydroxy alcohol and at least 4 mols of water in the presence of a non-oxidizing acid stronger than acetic acid. No. 2,246,049. Heinrich Lange to General Aniline & Film Corp.

A monoester of a polycarboxylic acid having at least two carboxylic acid groups connected with two adjacent carbon atoms and a tertiary amine alcohol. No. 2,246,264. Walter Pinkernelle to I. G. Farbenindustrie Aktiengesellschaft.

Process for the production of diacetyl which comprises heating, with a dilute mineral acid, the addition products of methyl vinyl ketone and hypochlorous acid. No. 2,246,299. Ernst Eberhardt and Robert Stadler to I. G. Farbenindustrie Aktiengesellschaft.

Xylyl methyl carbinamine. No. 2,246,529. Fred P. Nabenhauer to Smith Kline & French Labs.

Method of producing an enolic ether of a 10, 13-dimethyl-cyclopentanopolyhydrophenanthrene compound which comprises subjecting a 3-keto-10, 13-dimethyl-cyclopentanopolyhydro-phenanthrene compound having a double bond in the first ring to the action of an orthoformic acid ester. No. 2,246,540. Erwin Schwenk and Bradley Whitman to Schering Corp.

A propionic ester of 2-methyl-2-hydroxybutene-3. No. 2,246,545. Frank J. Soday to The United Gas Improvement Co.

Process of preparing a butyric ester of 2-methyl-2-hydroxy butene-3. No. 2,246,546. Frank J. Soday to The United Gas Improvement Co.

A valeric ester of 3-methyl-3-hydroxy-butene-1. No. 2,246,547. Frank J. Soday to The United Gas Improvement Co.

Process of preparing cyclopentane-hydrophenanthrene ketones. No. 2,247,147. Max Bockmuhl, Gustav Ehrhart and Heinrich Ruschig to Winthrop Chemical Co., Inc.

Reaction product of an alkyl halide of a higher alcohol derived from a fatty acid and durohydroquinone. No. 2,247,364. Erhard Fernholz to Merck & Co., Inc.

Process for refining phenols especially from oils, extracts and tarry liquors of lignite tar, from crude tar acids, and fractions thereof. No. 2,247,523. Friedrich Schick and Helmut Schramm to Deutsche Erdol-Aktiengesellschaft.

Method of producing acids of the cyclopentano polyhydro phenanthrene series and their esters. No. 2,247,822. Erwin Schwenk and Bradley Whitman to Schering Corp.

Process for preparing 2-mercaptoarylthiazoles by a reaction in which the reaction mass and product are maintained in liquid condition while producing substantial quantities of by-product gas. No. 2,247,894. Claude H. Smith to Wingfoot Corp.

Condensation product of phthaloimides and phenols. No. 2,247,899. Christian Wiegand to Winthrop Chemical Co., Inc.

A condensation product of an aldose with a 4-(4'-aminobenzenesulfonamido)-benzenesulfonamide, which product is soluble in water. No. 2,247,-913. Josef Klarer to Alba Pharmaceutical Co., Inc.

Fatty acid amides in which only one hydrogen atom attached to a carbon atom alpha to the carbonyl group is replaced by the group -S-D, wherein D is a thio carbamyl radical. No. 2,247,919. Joy G. Lichty to Wingfoot Corp.

Capillary active compounds and process of preparing them. No. 2,247,-921. Ludwig Orthner, Carl Platz, Hans Keller and Heinz Sonks to I. G. Farbenindustrie Aktiengesellschaft.

4-aryl-piperidine-ketones and a process of preparing them. No. 2,248,-018. Otto Eisleb to Winthrop Chemical Co.

Coatings

Method of coating metal. No. 2,245,225 and 2,245,226. Robert F. Renkin.

Liquid phenolic coating composition and process of making same. No. 2,245,245. George Alexander to General Electric Company.

Cellulose derivative, wax emulsion for coating wrapping materials. No. 2,245,499. Frank H. Reichel and Augustus E. Craver to Sylvania Industrial Corp.

Process of coating articles which comprises applying to their surface a homogeneous fluid dispersion of a vinyl resin in an essentially volatile organic liquid. No. 2,234,708. Carl W. Patton to Carbide and Carbon Chemicals Corp.

Herein described method of forming a thin aluminum-pigmented alkali-resistant baked coating on metal. No. 2,245,745. George L. Ball to Bali Chemical Co.

Plastic drying oil coating. No. 2,246,452. Orville V. McGrew.

Process of producing a protein coating composition. No. 2,246,983. Elmer B. Oberg to Unites States Gypsum Co.

Dyes, Stains, Etc.

Water-insoluble azo dye. No. 2,245,173. Werner Zerweck and Wilhelm Kunze to General Aniline & Film Corp.

Process of producing methinecyanine dyestuffs. No. 2,245,177. Fritz Bauer, Gustave Wilmanns and Kreis Bitterfield to General Aniline & Film Corp.

Azo compounds and material colored therewith. No. 2,245,259. Joseph B. Dickey to Eastman Kodak Co.

Azo compound and material colored therewith. No. 2,245,261 and 2,245,262. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Polyazo dyestuffs. No. 2,245,517. Paul Zervas to General Aniline & Film Corp.

Dyestuffs of the anthraquinone series. No. 2,245,520. Fritz Baumann and Heinz-Werner Schwechten to General Aniline & Film Corp.

Dyestuffs of the anthraquinone series. No. 2,245,521. Fritz Baumann and Heinz-Werner Schwechten to General Aniline & Film Corp.

Preparation of leuco esters of vat dyestuffs. No. 2,245,535. Otto Stallmann and Milton A. Prahl to E. I. du Pont de Nemours & Co.

Acid wool dyestuffs. No. 2,245,780. Ernst Heinrich to General Aniline and Film Corp.

Azo dyestuffs. No. 2,245,971. Friedrich Felix and Wilhelm Huber to Society of Chemical Industry in Basle.

Equipment and Apparatus

Apparatus for flowing high pressure oil and gas wells. No. 2,244,684. Edwin V. Foran to Eureka Process Co.

Regenerative coke oven of the circulation type. No. 2,244,711. Heinrich Koppers to Koppers Company.

Apparatus for regenerating spent petroleum processing clay particles by "burning" with air at closely controlled elevated temperatures. No. 2,244,724. John W. Payne to Socony-Vacuum Oil Co. Inc.

Apparatus for drying yarn. No. 2,244,745. Johannes Uytenbogaart and Carl F. Gram to North American Rayon Corp.

Apparatus for manufacturing cork composition material. No. 2,244,-750. Andrew Weisenburg to Crown Cork & Seal Co., Inc.

Liquid treating process and apparatus. No. 2,245,583. Walter H. Green to International Filter Co.

Liquid treating apparatus for water softening process. No. 2,245,587. Walter J. Hughes to Infilco, Inc.

Liquid treating apparatus and process. No. 2,245,588. Walter J. Hughes to International Filter Co.

Apparatus for production of low boiling point hydrocarbons. No. 2,245,625. Joseph W. Trotter.

An apparatus for combining chemicals consisting of a rotating brush, a housing closely surrounding said brush, and a fixed brush, the fixed brush being set in an insulating material and thus insulated from the rotating brush, for the purpose of subjecting a mixture of chemicals to the action of an electric current while undergoing treatment by said brush, and means for introducing a chemical into said casing. No. 2,245,632. Frederick W. Winkler ¼ to Charles H. Keel.

Pyrometric element. No. 2,245,687. Anker E. Krogh to The Brown Instrument Co.

Method of examining bodies by means of neutrons and electron emitting material. No. 2,245,787. Hartmut I. Kallmann and Ernst Kuhn to I. G. Farbenindustrie Aktiengesellschaft.

Process and apparatus for making beverages. No. 2,246,061. Roger L. Nowland.

Apparatus for performing rapid metallurgical operations between molten metal and a reacting substance. No. 2,246,133. Andre Greffe to Societe d'Electrochimie d'Electrometallurgie et des Acieries Electriques d'Ugine.

Method of and means for mixing and atomizing liquids. No. 2,246,211. Conrad Kilich.

A degreasing unit used in disposal of garbage or garbage and sewage sludge and the like. No. 2,246,224. Philip B. Streander to Municipal Sanitary Service Corp.

Apparatus for the catalytic cracking of hydrocarbons. No. 2,246,345. Oliver F. Campbell to Sinclair Refining Company.

Method and device for the investigation of substances by slowly moving neutrons. No. 2,246,443. Hartmut I. Kallmann and Ernst Kuhn to I. G. Farbenindustrie Aktiengesellschaft.

An internal heat exchange catalytic converter comprising contiguous catalytic and heat exchange passages. No. 2,246,684. David M. Hurt to E. I. du Pont de Nemours & Co.

Extrusion device and method of making formations of plastic material. No. 2,246,759. Ernest J. Roth and John L. Ellis to Joe Lowe Corp.

Apparatus for separating products from mineral wool blow chambers. No. 2,246,844. Daniel C. Drill to American Rock Wool Corp.

Method and apparatus for manufacturing thin gelatinous coatings. No. 2,246,872. Serge V. Beaune to Societe des Procedes Serge Beaune.

Method and apparatus for loading receptacles with volatile liquids. No. 2,246,875. Samuel C. Carney to Phillips Petroleum Co.

Apparatus and method for electrochemical analysis. No. 2,246,981. Lorne A. Matheson, Nathaniel B. Nichols, Harold A. Robinson and Clyde F. deChene to The Dow Chemical Co.

Catalytic heating apparatus. No. 2,247,035. Henry Pravaz.

Dialysis method and apparatus. No. 2,247,143. Dana H. Bailey to The Pfaudler Co.

An apparatus for multi-color dyeing of a wound open center skein of yarn. No. 2,247,346. Samuel Blair.

Emulsifying apparatus. No. 2,247,439. David M. Andrew Graham Hawes, deceased, by Frances Hawes to Joe Lowe Food Products Co., Ltd.

Bubble tower construction. No. 2,247,485. Wayner C. Edmister and Doyon H. Pollock to Standard Oil Company.

Apparatus for progressively separating continuous grouped filaments. No. 2,247,504. Rudolf Kern.

Tank for galvanizing metal articles by the lead-zinc process. No. 2,247,-854. Bernhard Ulbricht to Mitteldeutsche Stahlwerke Aktiengesellschaft.

Water softening apparatus. No. 2,247,964. Earl C. Reynolds.

Explosives

Process of making smokeless powder. No. 2,247,392. Milton F. Lindsley, Jr. to E. I. du Pont de Nemours & Co.

Fine Chemicals

Manufacture of modified organic isocolloid materials. No. 2,244,666. Laszlo Auer to J. Randolph Newman.

Organic chemical compositions and process for preparation of same. No. 2,245,147. Walter John and Phillip Gunther to Merck & Co.

Cyclammonium quaternary salts. No. 2,245,249. Leslie G. S. Brooker to Eastman Kodak Co.

Process for preparing cyclammonium quaternary salts. No. 2,245,250. Leslie G. S. Brooker to Eastman Kodak Co.

Preparation of 2-mercapto thiazolines. No. 2,245,361 and 2,245,362. Paul S. Pinkney to E. I. du Pont de Nemours & Co.

Preparation of calcium alpha hydroxyisobutyrate. No. 2,245,483. Philip Moore Kirk to American Cyanamid Co.

Sulfanilamide phosphoric acid derivative and process for the manufacture thereof. No. 2,245,539. Kurt Warnat to Hoffman-LaRoche, Inc.

Manufacture of unsaturated ketones. No. 2,245,567. Joseph H. Brant and Rudolph L. Hasche to Eastman Kodak Co.

Process of preparing arsanilic acid which comprises slowly adding arsenic acid to an excess of aniline which has been heated to about 82°C. while agitating, then rapidly heating to a temperature of about 155 to about 160°C., and maintaining that temperature for about four to five hours. No. 2,245,572. Walter G. Christiansen to E. R. Squibb & Sons.

Process for the manufacture of unsaturated aldehydes. No. 2,245,582. Milton Gallagher and Rudolph L. Hasche to Eastman Kodak Co.

Composition for the treatment of pathological conditions comprising an iodo casein capable of transferring its iodine to an aromatic compound in the presence of hydrogen peroxide at 35°C. No. 2,245,610. Charles W. Schaffer and Reinhard Beutner.

Method of obtaining borax soluble zeanin. No. 2,245,736. Lloyd C. Swallen and Harold Reintjes to Corn Products Refining Co.

Process for the manufacture of unsaturated aldehydes. No. 2,246,037. Milton Gallagher and Rudolph L. Hasche to Eastman Kodak Co.

Process for the preparation of progesterone by oxidizing cholestenone in sulfuric acid stronger than of 50% and isolating progesterone from the resulting reaction-mixture. No. 2,246,341. Hermann Bretschneider and András Salamon to Chinoin Gyogyszer és Vegyészeti Termékek Gyára R. T. (Dr. Kereszty & Dr. Wolf).

Process of refining and concentrating type-specific antipneumococcic rabbit serum. No. 2,246,355. Tillman D. Gerlough to E. R. Squibb & Sons.

Method of obtaining pregnandione compounds. No. 2,246,595. Russell E. Marker to Parke, Davis & Co.

Process for preparing irreversible starch derivatives. No. 2,246,635. Fredrik A. Moller to Naamlooze Vennvotschap.

Prolamin containing compositions and solutions. No. 2,246,779. Roy E. Coleman to Time, Inc.
The structural isomer of progesterone which corresponds to the empirical formula $C_{21}H_{30}O_2$. No. 2,246,889. Karl Miescher and Hans Kaegi to Ciba Pharmaceutical Products, Inc.
A mixed halogenated acetal. No. 2,247,482. Joseph B. Dickey and James B. Normington to Eastman Kodak Co.
Process of hardening and simultaneously increasing the sensitivity of photographic silver halide emulsions. No. 2,247,569. Johannes Brunken, Hans Fricke and Gustav Wilmanns to General Aniline & Film Corp.
Process for halogenation of phthalocyanines. No. 2,247,752. Arthur L. Fox to E. I. du Pont de Nemours & Co.
Manufacture of trialkyl borons. No. 2,247,821. Robert F. Ruthruff to Chempats, Inc.
An X-ray contrast composition containing a water soluble and non-toxic salt of an acid from the group consisting of tetraiodometaphthalic and tetraiodoparaphthalic acids. No. 2,247,880. Andre G. J. Guerbet.
Process of manufacture of stilboestrol and related compounds. No. 2,248,019. Louis F. Fieser and Walter G. Christiansen to E. R. Squibb & Sons.

Industrial Chemicals

Method for preparing protein materials. No. 2,244,680. Andrew G. Engstrom and Arthur A. Levinson to The Glidden Company.
Emulsifier comprising water-soluble soap, substantial amounts of a higher fatty acid, a saponifiable wax, and mutual solvent for water and fatty materials. No. 2,244,685. James H. Fritz and Ralph M. Beach to National Oil Products Co.
Water soluble salts of interpolymers containing methacrylic acid. No. 2,244,703. Leo P. Hubbach to E. I. du Pont de Nemours & Co.
Ammunition lubrication. John F. Hutchinson and Albert A. Schilling to Remington Arms Co., Inc.
Process of hydrating vinyl acetylene which comprises adding butanolone to vinyl acetylene in an acid solution of a heavy metal compound having a concentration of acid less than 10%. No. 2,244,837. Paul Halbig and Alfred Treibs to Consortium fur Elektrochemische Industrie.
In manufacture of adipic acid process comprising halogenating cyclohexane to produce cyclo-hexyl mono-halide splitting resulting halide to produce cyclohexene, hydrating resulting cyclohexene to produce cyclohexanol and oxidizing resulting cyclohexanol. No. 2,244,849. John F. Olin to The Sharples Chemicals Corp.
Process for the alkylation of isoparaffins with olefins by means of an acid alkylation catalyst. No. 2,245,038. Melvin M. Holm and Eugene H. Oakley to Standard Oil Co. of California.
Continuous process of chlorinating a titanium ore containing about 15 to 50 per cent of titanium and 10 to 50 per cent of iron. No. 2,245,076. Irving E. Muskat and Robert H. Taylor to Pittsburgh Plate Glass Co.
Chlorination of a titanium bearing material which contains a quantity of iron of such magnitude that upon chlorination of said material the amount of iron chloride formed is such as to cause plugging of the condenser system and at least 10% of titanium. No. 2,245,077. Irving E. Muskat and Robert H. Taylor to Pittsburgh Plate Glass Co.
Method of making metallic phthalocyanine compounds. No. 2,245,098. Frank S. Turek to Interchemical Corp.
Process for preparing linear polyamides. No. 2,245,129. Crawford H. Greenewalt to E. I. du Pont de Nemours & Co.
Process for the separation of ammonia and sulfureted hydrogen. No. 2,245,130. Joseph Guillissen to Union Chimique Belge Societe Anonyme.
Process which comprises refluxing monomeric vinyl acetate with an excess of benzoic acid distilling off the acetic acid and excess benzoic acid and distilling vinyl benzoate from the residue. No. 2,245,131. Willy O. Herrmann and Wolfram Haehnel to Dr. Alexander Wacker Gesellschaft fur Elektrochemische Industrie.
Treatment of olefin hydrocarbons in catalytic processes wherein a reactant is passed through a hydrated catalyst. No. 2,245,143. Clarence G. Gerhold to Universal Oil Products Co.
Process for the production of substantially stable fused saltpeter baths. No. 2,245,155. Josef M. Michel to Walther H. Duisberg.
An alkaline mercerizing solution containing as a wetting agent an N-alkylated aromatic amine di-sulfonate. No. 2,245,162. Robert L. Sibley to Monsanto Chemical Co.
Method of testing the quality of a gaseous atmosphere, which comprises creating an arc in said atmosphere and measuring a time-dependent characteristic of the arc. No. 2,245,168. Chauncey G. Suits to General Electric Co.
Production of olefin oxides by catalytic oxidation of olefins. No. 2,245,183. Bruno Christ and Fritz Hanusch to General Aniline & Film Corp.
Method of removing iron chloride from a vaporized mixture of iron chloride and titanium tetrachloride which comprises condensing iron chloride in the mixture and washing the vapor mixture containing at least a portion of the iron chloride with liquid titanium tetrachloride to precipitate suspended solid iron chloride. No. 2,245,358. Alphonse Pechukas to Pittsburgh Plate Glass Co.
Method of making solid succinic anhydride. No. 2,245,404. Mearl A. Kise and Ralph R. Wenner to The Solvay Process Co.
Fluorescent zinc beryllium silicate for gaseous electric discharge lamps containing a source of ultraviolet radiation comprising by weight approximately 60 parts zinc oxide, 40 parts silica, 1 to 10 parts beryllium oxide and 2 to 10 parts manganese dioxide. No. 2,245,414. Willare A. Roberts to General Electric Co.
An article of manufacture consisting of a polymer of polyvinyl chloride said polymer containing as the sole plasticizer therefor an addition of no more than 5% of elementary sulfur. No. 2,245,500. Herbert Rein and Karl Rossler to I. G. Farbenindustrie Aktiengesellschaft.
Manufacture of nickel carbonyl. No. 2,245,503. Leo Schlecht, Rudolf Staeger and Hermann Klippel to I. G. Farbenindustrie Aktiengesellschaft.
Process for the production of 4, 4'-dichlorodibutyl ether which consists in heating 4-chlorobutanol and hydrogen chloride in the liquid phase under superatmospheric pressure to temperatures exceeding 110°C. No. 2,245,509. Hans-Georg Trieschmann to I. G. Farbenindustrie Aktiengesellschaft.
Method for the absorption of bromine. No. 2,245,514. Arthur T. Williamson to Imperial Chemical Industries Ltd.
Method of oxidizing aromatic compounds containing substituents. No. 2,245,528. Donald J. Loder to E. I. du Pont de Nemours & Co.
Process of removing volatile material from a product including both volatile and non-volatile materials. No. 2,245,536. Benjamin H. Thurman to Refining, Inc.
Process of recovering relatively pure phosphatides from vegetable oils containing gummy materials. No. 2,245,537. Benjamin H. Thurman to Refining, Inc.
Process of producing substantially pure higher fatty alcohols and high quality soap. No. 2,245,538. Benjamin H. Thurman to Refining, Inc.
Method of preparing an ester of an alpha halocrylic acid which comprises dehydrohalogenating an ester of a dihalopropionic acid having at least one halogen in the alpha position. No. 2,245,547. Maxwell A. Pollack to Piittsburgh Plaate Glass Co.
In process of purifying naphthenic acids the step comprising reacting crude naphthenic acids with ammonia to form naphthenic acid nitriles and then separating the nitriles from the reaction mixture. No. 2,245,548. Anderson W. Ralston and James Harwood to Armour & Co.
Process of producing highly concentrated oxides of nitrogen. No. 2,245,550. Leonid Andrussow and Karl Braun to I. G. Farbenindustrie Aktiengesellschaft.
Process of preparing activated carbon. No. 2,245,579. Raymond G. Davis.
Process for removing turbidity-imparting solids from water by treatment with a coagulant. No. 2,245,589. Walter J. Hughes to International Filter Co.
Pour point depressor having a boiling point sufficiently high to be left as a residue when the naphtha is distilled off from a naphtha solution thereof. No. 2,245,639. Jeffrey H. Bartlett and Arthur J. Zadde to Standard Oil Development Co.
Method of molding paraffin wax. No. 2,245,640. Robert Beattie ¾ to Tide Water Associated Oil Co.
Process of preparing sulfonic acids of high wetting, cleansing and emulsifying properties which include the step of condensing the oxygenated terpene with an ether containing an aryl group and the step of sulfonating the said aryl group. No. 2,245,643. Joseph N. Borglin to Hercules Powder Co.
Process for making anhydrous sodium bisulfite. No. 2,245,697. Jesse G. Melendy to General Chemical Co.
Process for the recovery of ethylene and propylene from gaseous mixtures of ethylene and propylene and saturated hydrocarbons. No. 2,245,719. Richard F. Robey to Standard Oil Development Co.
Method which comprises polymerizing in an aqueous emulsion a mixture of vinyl chloride and vinylidene chloride in which the vinylidene chloride is present in not more than 75% by weight of the vinyl chloride. No. 2,245,742. Claude H. Alexander and Harold Tucker to The B. F. Goodrich Company.
Chlor-addition of nontertiary olefins. No. 2,245,776. Herbert P. A. Groll, George Hearne and Donald S. La France to Shell Development Company.
Method of forming ethylene from petroleum hydrocarbons having a boiling point above about 300°. No. 2,245,819. Frank Porter to The Solvay Process Co.
Electrolysis of salts in liquid ammonia. No. 2,245,831. Charles Forbes Silsby to The Solvay Process Co.
Continuous process for refining fatty oils. No. 2,245,846. Arthur U. Ayres to The Sharples Corp.
Process for fractionating a mixture containing essentially isomeric organic compounds. No. 2,245,945. Willem J. Dominicus van Dijck and Albert Schaafsma to Shell Development Co.
Method of preparing an ester of acetic acid which comprises causing a vinylidene dihalide to react with a metal alcoholate of a monohydric alcohol at a temperature between about 20° and about 70°C. and separating the ester so formed. No. 2,245,962. Gerald H. Coleman, Ralph M. Wiley and Bartholdt C. Hadler to The Dow Chemical Co.
Treatment of friedel-crafts reaction liquors. No. 2,246,007. Harold A. Robinson to The Dow Chemical Co.
Production of hydrocyanic acid by reaction of ammonia and carbon monoxide at a temperature between 400° and 450° centigrade, in the presence of calcium oxide, whereby secondary reactions of carbon monoxide and steam are avoided. No. 2,246,014. Richard T. Schraubstadter.
Method which comprises contacting an aromatic vinyl compound with a metal selected from the class consisting of copper and alloys essentially comprising copper and thereafter polymerizing said compound by heating at a temperature above 80°C. whereby a colored polymer is obtained. No. 2,246,020. Sylvia M. Stoesser and Orville A. Braley to The Dow Chemical Co.
Process for the production of beta gamma unsaturated ketones. No. 2,246,032. Franklin A. Bent to Shell Development Co.
Water-soluble condensation products. No. 2,246,071. Heribert Schussler, Heinrich Morschel and Wilhelm Meiser to General Aniline and Film Corp.
Process of manufacturing alkyl halides of the group consisting of ethyl chloride and ethyl bromide from a mixture of saturated aliphatic hydrocarbons gaseous under operating conditions and ethylene. No. 2,246,082. William E. Vaughan and Frederick F. Rust to Shell Development Co.
Aqueous paste comprising 1 to 50 parts of urea and 1 part of a mixture obtained by the conjoint sulfation of a normal primary aliphatic alcohol of at least 8 carbon atoms and a higher petroleum hydrocarbon. No. 2,246,085. Luther B. Arnold, Jr. to E. I. du Pont de Nemours & Co.
Binding agent for lead plate secondary batteries which consists of the paste from used positive plates plus iron oxide in a relatively small quantity on the order of approximately .35% by weight. No. 2,246,222. Clarence A. Rodgers.
Process for separating a high molecular weight mixture into fractions having different properties. No. 2,246,227. Wells A. Webb to Shell Development Co.
Process for separating a mixture of organic compounds. No. 2,246,257. Gerhard Kohn to Shell Development Co.
Unsaturated esters. No. 2,246,285. Erving Arundale and Louis A. Mikeska to Standard Oil Development Co.
Mineral oil sulfonates, their purification and fractionation. No. 2,246,374. Charles J. Lohman and Latimer D. Myers to Emery Industries, Inc.
Reduction of chromates to produce chromic oxide. No. 2,246,396. Omar F. Tarr and Llewellyn G. Tubbs to Mutual Chemical Co. of America.
Process of preparing a derived soybean protein which comprises digesting an aqueous caustic alkali and lime solution of extracted soybean protein with sodium peroxide in an amount and for a time sufficient to reduce the viscosity of the protein. No. 2,246,466. Percy L. Julian and Bernard T. Malter to The Glidden Co.
A substantially completely dehydrated lime soap lubricant. No. 2,246,467. Gus Kaufman and Robert S. Barnett to The Texas Company.
Hydrogenation of lignin sulfonic acid. No. 2,246,481. Homer Atkins and Guy C. Howard to Marathon Paper Mills Co.
Process for oxidizing ethers. No. 2,246,569. Ralph L. Brown to The Solvay Process Co.
Method of supplying liquids at constant rates by displacement. No. 2,246,594. Edward Kinsella to Celanese Corp. of America.
Process of making higher fatty acid anhydrides. No. 2,246,599. Horace F. Oxley and Edward B. Thomas to Celanese Corp. of America.
Process of extracting bromine and iodine from liquids containing said halogens. No. 2,246,645. Oliver M. Urbain and William R. Stemen to Charles H. Lewis.

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Process of extracting bromine and iodine from liquids containing said halogens which comprises making said liquids alkaline and contacting said liquids with an active carbon which has been first saturated with an ammoniacal gas then saturated with chlorine. No. 2,246,646. Oliver M. Urbain and William R. Stemen to Charles H. Lewis.

In process for storing sulfur step comprising providing molten sulfur on surface of pile of finely divided sulfur and permitting molten sulfur to solidify and form a coating on the pile. No. 2,246,666. Charles S. Collier and Lee A. Myers to E. I. du Pont de Nemours & Co.

Apparatus for charging a current of air with a volatile substance. No. 2,246,734. Adrianus Kleijn.

Method condensing compounds which contain at least one olefinic double link in the molecule with compounds containing at least one aromatic nucleus with at least one unsubstituted hydrogen atom in the aromatic nucleus in the presence of aqueous mixtures of perchloric acid together with mineral acid of the group consisting of sulfuric acid, hydrochloric acid and phosphoric acid. No. 2,246,762. Erik Schirm to "Unichem" Chemikalien Handels A.-G.

Method of dehydrating a hydroxylated fat or fatty acid of the ricinoleic series. No. 2,246,768. Richard T. Ubben and James R. Price to Armstrong Paint & Varnish Works.

Method of controlling the physical dimensions of molded hydrocolloid bodies. No. 2,246,822. Walter J. van Rossem to Surgident Ltd.

Process for breaking petroleum emulsions of the water-in-oil type. No. 2,246,842. Melvin De Groote to Petrolite Corp., Ltd.

Process for breaking petroleum emulsions of the water-in-oil type. No. 2,246,856. Louis T. Monson and William W. Anderson to Petrolite Corp., Ltd.

An aryl-amino alkenyl monohydric phenol of the benzene series in which the alkenyl and hydroxy groups are attached to the same benzene nucleus. No. 2,246,924. Philip T. Paul to United States Rubber Co.

Method of fractional distillation. No. 2,246,934. Courtlandt F. Denney to Foster Wheeler Corp.

Process for the catalytic polymerization of diolefins in which there is used as a catalyst a peroxide selected from the group consisting of the peroxides of tetrahydro-furfurane and its homologues. No. 2,246,937. Henri M. Guinot to Les Usines de Melle.

In manufacture of trinitroresorcinol by the sulfonation of resorcinol with sulfuric acid and subsequent nitration with nitric acid the step which comprises adding a nitrite to the sulfuric acid. No. 2,246,963. John W. Wilkinson to Western Cartridge Co.

Treatment of wood tar distillate. No. 2,246,973. Alfred A. Camilli and Malcolm K. Johnston to Cliffs Dow Chemical Co.

Aryloxy alkyl esters of cinnamic acid. No. 2,246,974. Gerald H. Coleman and Bartholdt C. Hadler to The Dow Chemical Co.

Cyclohexyl unsymmetrical diphenyl ethanes. No. 2,246,988. Frank B. Smith and Harold W. Moll to The Dow Chemical Co.

Electrically conductive bonded oxide composition. No. 2,247,036. Samuel Ruben.

Process for the production of hydrocarbons. No. 2,247,087. Wilhelm Herbert to American Lurgi Corp.

Fatty acid salts of polyhydroxy amines. No. 2,247,106. Byron M. Vanderbilt to Purdue Research Foundation.

A continuous distillation process for carbonization of solid fuels, bituminous slates and the like. No. 2,247,185. Lorenzo Caccioppoli.

Method making fluorescent material which comprises heating to about 850°C. a mixture of zinc oxide and silica a crystallization-retarding reagent, and about 0.5 to 40% of a catalytic metallic halide. No. 2,247,192. Gorton R. Fonda to General Electric Co.

Method of preparing calcined gypsum which comprises incomplete calcination of raw gypsum of varying particle size, substantial separation of calcined and uncalcined portions thereof and calcination of said uncalcined portions No. 2,247,221. Manvel C. Dailey to United States Gypsum Co.

Process improving the stability of nitroparaffins. No. 2,247,255. Murray Senkus to Commercial Solvents Corp.

Cyclic acetals and production thereof. No. 2,247,256. Murray Senkus to Commercial Solvents Corp.

Capillary-active agent said agent being a water soluble acid salt of a water-soluble polybasic acid and a non-quaternary alkyl pyridine. No. 2,247,266. Johan Pieter Wibaut and Johan Overhoff to Shell Development Co.

A fatty oil having incorporated therein a neutral phosphate of a polyhydric phenol in an amount sufficient to preserve said fatty oil. No. 2,247,280. George D. Martin to Monsanto Chemical Co.

An oxidizable fatty material having incorporated therein a di-biphenyl amine in an amount sufficient to retard the development of color and rancidity to a substantial degree. No. 2,247,281. George D. Martin to Monsanto Chemical Co.

Process of purifying vegetable and animal oils. No. 2,247,359. Benjamin Clayton and Walter B. Kerrick and Henry M. Stadt to Refining, Inc.

Process of making a phosphoric acid which has a phosphorus pentoxide content higher than orthophosphoric acid. No. 2,247,373. Charles E. Hartford and Marcus M. Striplin.

Method of polymerizing rosin and product made thereby. No. 2,247,399. Robert C. Palmer and Carlisle H. Bibb to Newport Industries, Inc.

A relatively high melting stable nuclearly hydrogenated polymerized rosin. No. 2,247,400. Robert C. Palmer and Carlisle H. Bibb to Newport Industries, Inc.

Aralkyl phenol and method of making it. No. 2,247,402. Ralph P. Perkins and Fred Bryner to The Dow Chemical Company.

Aralkyl polynuclear phenol. No. 2,247,403. Ralph P. Perkins and Fred Bryner to The Dow Chemical Co.

Aralkyl polyhydric phenol. No. 2,247,464. Ralph P. Perkins and Fred Bryner to The Dow Chemical Co.

A fuel material comprising a solid carbonaceous fuel having an ash high in silica and alumina and with a low total content of lime and alkali and containing sulfur in pyritic form, and an admixture consisting of basic phosphate and sulfate matters. No. 2,247,415. Albert L. Stillman.

Monoethers of dimethylol urea and process for making same. No. 2,247,419. Ben E. Sorenson to E. I. du Pont de Nemours & Co.

Process refining fatty oils. No 2,247,430 Arthur U. Ayers to The Sharples Corp.

Process of dehydrogenating aliphatic hydrocarbons of the paraffin series which contain at least 2 but less than 10 C. atoms. No. 2,247,465. Hans Baehr to William E. Currie.

Process for the separation of a mixture of liquid nitrosyl chloride and chlorine No. 2,247,470. Herman A. Beekhuis, Jr. to Solvay Process Co.

Tertiary alkyl urea and process for preparing same. No. 2,247,495. Mortimer T. Harvey and Solomon Caplan to Harvel Research Corp.

Process of refining and fractionation of tall oil. No. 2,247,496. Arthur W. Hixson and Ralph Miller to The Chemical Foundation, Inc.

Process of recovering chemical from waste pulping liquor. No. 2,247,584. Harold R. Murdock to The Champion Paper and Fibre Co.

Process for the recovery of hydrocarbons. No. 2,247,594. Victor Bayerl to Carbo-Norit-Union Verwaltungs-Gesellschaft m. b. H.

Method of producing fine aluminum hydrate from an alkaline aluminous solution. No. 2,247,624. James R. Wall to Aluminum Company of America.

Method of producing a noncorrosive inert gas containing a major proportion of nitrogen from combustion gases containing traces of oxygen and nitrogen. No. 2,247,625. Walter J. Willenborg to Charles L. Caughlin.

Process of sterilizing liquids which comprises passing into contact with solid particles having absorbed on their surfaces a compound chosen from the group consisting of aliphatic amines in which a hydrocarbon radical contains at least six carbon atoms and salts thereof. No. 2,247,711. Anderson W. Ralston and Ervin W. Hopkins to Armour and Company.

Process for the preparation of stable aqueous emulsions of a bituminous material such as road tars, pitch and bitumen suitable for use on roads. No. 2,247,722. William J. Chadder, Henry M. Spiers and Edwin Arnold to Thermal Industrial and Chemical (T. I. C.) Research Co., Ltd.

Washing, wetting and emulsifying agents. No. 2,247,741. Hans Beller and Egi V. Vasce to Jasco Inc.

Process for the manufacture of alcohols and ketones. No. 2,247,756. Benjamin W. Howk and Wilber A. Lazier to E. I. du Pont de Nemours & Co.

Method of polymerizing an alpha chloroacrylate while minimizing color formation during the polymerization which comprises conducting the polymerization under substantially anhydrous conditions. No. 2,247,790. Franklin Strain and Maxwell A. Pollack to Pittsburgh Plate Glass Co.

Continuous process for preparing gel-type chromic oxide catalyst. No. 2,247,820. Robert F. Ruthruff to Process Management Company, Inc.

Process for preparing food from oleaginous, protein-base, organic material. No. 2,247,851. Henry Rosenthal.

Manufacture of sodium phenate. No. 2,247,877. William H. Garrett and Sydney Smith to Monsanto Chemical Co.

Improvement in preparation of phthalic anhydride by partial oxidation of a polynuclear aromatic compound in vapor phase. No. 2,247,910. William A. Douglass and Harold La Belle Jones to E. I. du Pont de Nemours & Co.

Method of providing a perforated lining for the bore of a well penetrating a fluid producing formation. No. 2,248,028. Carl F. Prutton to The Dow Chemical Co.

Process of nitrosating aromatic alkyl ketones. No. 2,248,035. Walter H. Hartung and Frank S. Crossley to Sharp and Dohme, Inc.

Leather

Apparatus for applying depilating material on carcasses. No. 2,245,553. Oscar Biedermann and Frank J. Bilick to The Globe Company.

Metals, Alloys

Method of treating ferrous metal articles to increase paint adhesion comprises subjecting said articles to action of aqueous solution of ammonium acid fluoride and drying same upon said surfaces. No. 2,244,740. Robert R. Tanner.

Bath for electrodeposition of zinc comprising an acid solution of zinc sulfate and an addition agent adapted to act as a catalyst and consisting of an unsubstituted alkylamine of the character described in an amount substantially equivalent to that supplied within the range of 0.000025-0.005 cc. per liter (25% by weight $(CH_3)_3N$) aqueous solution. No. 2,245,086. John L. Bray and Facundo R. Morral to Purdue Research Foundation.

Cold worked aluminum base alloy and method of producing it. No. 2,245,166. Philip T. Stroup to Aluminum Co. of America.

Wrought aluminum base alloy and method of producing it. No. 2,245,167. Philip T. Stroup to Aluminum Co. of America.

Process of precipitating metals from hydro-metallurgical solutions. No. 2,245,217. Kenneth S. Mowlds to The Glidden Co.

Alloys consisting of arsenic 0.5 to 5%, phosphorous 4.5 to 8.5%, balance substantially all copper. No. 2,245,327. Edward S. Bunn and Irving T. Bennett to Revere Copper and Brass Inc.

Method of hardening cobalt-nickel-chromium iron alloys. No. 2,245,366. Wilhelm Rohn, Franz Bollenrath and Heinrich Cornelius.

An alloy consisting of about 40% zinc, 0.01 to 3% phosphorous, 0.1 to 3% lead and the balance copper, said alloy having the characteristic strength hardness and other properties resulting from the cold working of an alloy of said composition. No. 2,245,459. Georg Buhler.

Making low-alloy high-strength steel of the copper-phosphorous-silicon-chromium type. No. 2,245,482. Clarence D. King to U. S. Steel Corp.

Process for replenishing and correcting the electrolyte in the refining of aluminum. No. 2,245,505. Karl Siedentopf to "Compagnie de Produits Chimiques et Electro-metallurgiques Alais."

New article of manufacture comprising a cast ternary alloy of nickel, chromium and silicon, said silicon being in the proportion of 6% to 12%, said chromium in the proportion of 9% to 30% and the balance nickel. No. 2,245,566. John W. Bolton to The Lunkenheimer Co.

A method of detecting cracks, flaws or seams in articles made of ferromagnetic materials. No. 2,245,568. Robert H. Canfield.

Metal finishing process. No. 2,245,609. Gerald C. Romig to American Chemical Paint Co.

Method of preparing metal molds for use in the centrifugal casting of iron or steel pipes, tubes, or the like. No. 2,245,747. Clarence D. Barr to American Cast Iron Pipe Company.

Process for improving the physical properties and for shortening the annealing time of malleable iron which comprises melting the iron in a fuel fired furnace and maintaining the hydrogen in the melted iron under about 0.0005 per cent by controlling the moisture content of the air blast used to support combustion of the fuel. No. 2,245,876. Harry A. Schwartz to National Malleable and Steel Casting Co.

Improved copper-lead bearing alloy. No. 2,246,067. Willard H. Rother to Sumet Corp.

Heat treatment for aluminum base alloys. No. 2,246,134. Richards H. Harrington to General Electric Co.

Method for producing sintered hard metal from pulverulent materials. No. 2,246,165. Walther Dawihl and Hermann Franssen to General Electric Co.

Sintered hard metal alloy for implements and tools. No. 2,246,166. Walther Dawihl and Karl Schroter to General Electric Co.

A dental alloy consisting of 10-49% chromium, 20-48% cobalt, 3-15% molybdenum, 10-40% nickel, 3-12% tungsten and 0.25-3% zirconium. No. 2,246,288. Maude Braid.

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Process for producing metallic chromium which comprises passing a current of unpurified, technically produced hydrogen over chromium chloride at an elevated temperature under reduced pressure of at most about 100 mm. Hg. No. 2,246,386. Kurt Schneider to I. G. Farbenindustrie Aktiengesellschaft.

Sintered hard metal alloy, in particular for tools. No. 2,246,387. Paul Schwarzkopf to American Cutting Alloys, Inc.

Stabilization of austenitic chromium nickel steels. No. 2,246,445. George C. Kiefer to Allegheny Ludlum Steel Corp.

Copper-base bearing lining composition comprising copper and particles consisting substantially of lead combined with a minor amount of indium, said granules being at least substantially coated with said copper. No. 2,246,462. Ernst R. Darby to Federal-Mogul Corp.

Combined coolant and lubricant for cold reduction apparatus comprising a solution of approximately 1% to 50% palm oil, 50% to 99% water and 3% to 33 1/3% lactic acid. No. 2,246,549. Earl D. Spangler.

Manganese-base alloy and method of making and using the same. No. 2,246,886. William Kroll.

Method of producing a molten slag suitable for use in the purification of metals. No. 2,247,262. Marvin J. Udy.

Process and product for the production of low-carbon chromium alloys. No. 2,247,262. Marvin J. Udy.

Electrothermic reduction of volatile metals. No. 2,247,334. Samuel R. Keemie to Universal Light Metals Co.

Apparatus for heating mass of metal powder to bring about metallic bonding therebetween. No. 2,247,370. Claus G. Goetzel to Hardy Metallurgical Co.

Wiping solder. No. 2,247,559. George S. Phipps and Earle E. Schumacher to Bell Telephone Laboratories, Inc.

Process for heat treating a metal article to a predetermined temperature. No. 2,247,579. Donald A. Holt to E. I. du Pont de Nemours & Co.

Process of producing black-colored aluminum or aluminum alloys. No. 2,247,580. Otto Jauch to Robert Bosch Gesellschaft mit beschrankter Haftung.

Method of hardening an alloy consisting of from 14 to 17% chromium, 14 to 16% iron, 5 to 7% molybdenum, 0.05 to 7% tungsten, 15 to 27% cobalt, and 52 to 27% nickel, which method consists in cold working the said alloy. No. 2,247,643. Wilhelm Rohn, Franz Bollenrath and Heinrich Cornelius.

Alloy steel for the manufacture of wheels and tires. No. 2,247,876. Harry L. Frevert to The Midvale Co.

Method and apparatus for hot shaping magnesium alloy plates. No. 2,247,979. Walter M. von Tannenberg to Leipziger Leichtmetall Werk Rackwitz, Bernhard Berghauser u. Co.

Paints and Pigments

Method of manufacturing coated pigments. No. 2,245,104. Paul W. Greubel to Interchemical Corp.

Improved method for dispersing titanium dioxide pigments in aqueous media. No. 2,246,030. Robert W. Ancrum and Assur Gjessing Oppegaard to Titan Company, Inc.

Titanium dioxide composite pigment and method of making same. No. 2,246,062. Walter W. Plechner and Hugh V. Alessandroni to National Lead Co.

A cement-line water paint. No. 2,246,620. John F. Comeau.

Paint as described comprising 5 gallons of cold, soft water; 5 ounces of antimony chloride, 2½ pounds of blue powder, 10 pounds of mineral coloring, and 2½ pounds of diatomaceous earth. No. 2,247,633. William K. Hearn.

Black ceramic pigment consisting essentially of a compound of copper and chromium having a chromium to copper molecular ratio falling within the range 1.5:1 to 2.5:1. No. 2,248,021. Charles G. Geary to E. I. du Pont de Nemours & Co.

Paper and Pulp

Pulp molding apparatus. No. 2,245,678. Andrew Keiding to American Lace Paper Co.

A composition of matter containing zein and alkali rosinate in an aqueous solution. No. 2,247,351. Pierre Drewsen and John R. Little to The Hinde & Dauch Paper Co.

Petroleum

Improved lubricating oil comprising major proportion of mineral oil and minor amount of a sulfur-chloride treated condensation product of a halogenated paraffin and an aromatic hydrocarbon. No. 2,244,886. Bert H. Lincoln and Alfred Henriksen to The Lubri-Zol Development Corp.

In method of refining solvent refined petroleum oils with porous absorptive materials the improvement which comprises refining said solvent refined oils with a finely divided porous absorptive material carrying an outer layer deposit of activated carbon produced from petroleum carbonaceous matter. No. 2,245,016. Thomas P. Simpson, John W. Payne and Peter D. Valas to Socony-Vacuum Oil Co., Inc.

Recovery of liquid hydrocarbons from moisture containing well fluids. No. 2,245,028. Riley F. Farris to Stanolind Oil and Gas Co.

A reaction chamber adapted to contain a plurality of beds of solid contact material. No. 2,245,145. Homer J. Hall and Nicholas Menshih to Standard Oil Development Co.

Process for the production of safety fuels stable to knocking which comprises subjecting to cracking higher boiling mainly aliphatic hydrocarbon oils. No. 2,245,157. Mathias Pier and Gerhard Free to William E. Currie.

Petroleum nitrosulfonic acids and method of making same. No. 2,245,190. William K. Briesinger and Bernard Bettman to Atlantic Refining Co.

Recovery of solutizers. No. 2,245,311. Ellis R. White to Shell Development Co.

Process of producing relatively pure mercaptans from a hydrocarbon oil. No. 2,245,317. Richard A. Bannerot to Shell Development Co.

Method of separating suspended free water from oil. No. 2,245,551. Gale L. Adams, Roy G. Barlow and Abraham Shapiro to Socony-Vacuum Oil Co., Inc.

Apparatus for testing used lubricating oils. No. 2,245,557. John J. Franzman to Cities Service Oil Co.

An improved substantially anhydrous lubricating grease consisting of mineral oil, from 10 to 40% of a soda soap and barium soap mixture, the said soaps being in a proportion of from about 10 to 1, to about 1 to 1. No. 2,245,702. Arnold J. Morway to Standard Oil Development Co.

Process for reforming and polymerizing hydrocarbons. No. 2,245,733. Philip Subkow to Union Oil Company of California.

Process for cracking and polymerizing hydrocarbons. No. 2,245,734. Philip Subkow to Union Oil Company of California.

Process for simultaneous cracking and polymerizing of hydrocarbons. No. 2,245,735. Philip Subkow to Union Oil Company of California.

Method of flowing an oil well to prevent the accumulation of paraffin in flow tubing. No. 2,245,870. Pearl C. Norman to Phillips Petroleum Company.

Method of drilling wells using mud and acid. No. 2,245,886. James W. Weir and Henry S. Montgomery 30% to Harold C. Miller and 10% to Gerald B. Shea and 20% to Alfred W. Knight.

Process of dewaxing mineral oil. No. 2,245,952. Robert H. Aitken and Wynkoop Kiersted, Jr. ½ to Indian Refining Co., and ½ to The Texas Co.

An improved mineral oil composition comprising a petroleum oil of relatively high boiling point normally tending to deteriorate by oxidation when heated and in admixture therewith a small proportion sufficient to retard said deterioration and depress the pour point of the oil, of a triaryl phosphite in which at least one of the aryl radicals has at least one relatively long chain alkyl substituent of the general order corresponding to paraffin wax. No. 2,246,059. Robert C. Moran, William L. Evers and Everett W. Fuller to Socony-Vacuum Oil Co., Inc.

An emulsifiable spray oil composition comprising a mineral oil and a small quantity of an unsaponified fluid castor oil thermally treated under conditions to effect a change in its viscosity and molecular weight and to render it soluble in mineral oils. No. 2,246,330. Wallace J. Yates to Shell Development Co.

Improved method for producing valuable lubricants comprising bringing a fatty oil into incipient reaction with a sulfur halide, then sulfurizing the material with free sulfur. No. 2,246,281. John C. Zimmer and Arnold J. Morway to Standard Oil Development Co.

Improved method for preparing sulfurized oils which comprises preliminarily sulfurizing an unsaturated organic substance, then blending the preliminarily sulfurized product with mineral oil and resulfurizing the blend with free sulfur by heating with free sulfur. No. 2,246,282. John C. Zimmer and Arnold J. Morway to Standard Oil Development Co.

Solvent extraction process. No. 2,246,297. Gordon W. Duncan and James M. Whiteley, Jr. to Standard Oil Development Co.

Composition of matter comprising a waxy lubricating oil and a small amount of polymerized acid halide of naphthenic acid. No. 2,246,312. Eugene Lieber to Standard Oil Development Co.

An extreme pressure lubricant composition comprising a hydrocarbon lubricant and an alkyl phenol sulfide in an amount between above 5% and 25%. No. 2,246,314. Louis A. Mikeska to Standard Oil Development Co.

Method of regenerating contact masses containing carbonaceous masses. No. 2,246,367. Robert W. Krebs to Standard Oil Development Co.

Solvent treating of mineral oils. No. 2,246,376. Charles S. Lynch to Standard Oil Development Co.

Lubricant comprising mineral lubricating oil and from about 0.5% to 45% of rosin materials, and sulfur in solution in the lubricant in the order of 40% based on the rosin content. No. 2,246,415. Ralph A. Potter to Union Oil Co. of Calif.

Method for making a fuel consisting predominantly of normally fluid hydrocarbons in solidified form. No. 2,246,552. Eugene D. Stirlen to Safety-Fuel Inc.

Cracking process for conversion of hydrocarbon oils. No. 2,246,592. Lyman C. Huff to Universal Oil Co.

Process for the conversion of hydrocarbon oils. No. 2,246,607. Kenneth Swartwood to Universal Oil Products Co.

A process for treating the gases and gasoline produced in hydrocarbon oil conversion. No. 2,246,643. Kenneth D. Uitti to Universal Oil Products Co.

Method of effecting continuous catalytic conversion of hydrocarbons. No. 2,246,654. Maurice H. Arveson to Standard Oil Co.

As a hydrocarbon conversion catalyst nickel and platinum supported on magnesium chromite. No. 2,246,682. Llewellyn Heard and Alex G. Oblad to Standard Oil Co.

Continuous process for the alkylation of an isohydrocarbon of the class consisting of isobutane, isopentane and isohexane. No. 2,246,703. Ernest W. Thiele and Robert C. Gunness to Standard Oil Co.

Improved lubricating oil which comprises a petroleum lubricating oil containing an effective amount of di(lauryl phenol) disulfide. No. 2,246,712. Edwin J. Barth to Sinclair Refining Co.

Method of treating an oil well to convert a water-wet producing sand to one which is preferentially wettable by oil. No. 2,246,725. Allen D. Garrison to The Texas Company.

Method of treating a water-wet producing sand of an oil well to improve the production of oil relative to the production of water from the well. No. 2,246,726. Allen D. Garrison to The Texas Co.

An improved method for the rapid regeneration without injury of a catalyst mass used for the conversion of higher boiling hydrocarbons into lower boiling hydrocarbons. No. 2,246,950. Edward B. Peck to Standard Oil Development Co.

Catalytic cracking of hydrocarbon oil. No. 2,246,959. William H. Sweeney to Standard Oil Development Co.

Process for making a hydrocarbon olefin derivative containing from approximately six to twelve carbon atoms in which the olefin is obtained from a normally gaseous mixture containing undesired saturated hydrocarbons. No. 2,246,980. Henry N. Lyons to Cities Service Oil Co.

Process for separating hydrocarbon mixtures free from asphalt into fractions of different characters. No. 2,246,982. Gerrit W. Nederbragt to Shell Development Co.

Extreme pressure lubricants. Nos. 2,247,042 to 2,247,046. Henry G. Berger, Darwin E. Badertscher and Francis M. Seger to Socony-Vacuum Oil Co.

Catalytic cracking of hydrocarbon oil. No. 2,247,097. Nicholas Menshih to Standard Oil Co.

In preparation of petroleum distillates providing a distillate containing cracked material estimating the sulfur content and reducing constituents causing colored products, by subjecting the distillate to elevated temperature with an amount of iron carbonyl less than what would correspond to the amount required to react with the total sulfur. No. 2,247,148. Robert E. Burk to Standard Oil Company.

Method of producing asphalt from petroleum residual oil containing less than about 10% of asphaltenes. No. 2,247,371. Donald B. Harrison to The Atlantic Refining Company.

Method of increasing the melting point of a material substantially solely of bituminous origin. No. 2,247,375. Arthur B. Hersberger to The Atlantic Refining Co.

An over-refined low V.G.C. highly paraffinic lubricating oil containing an added petroleum extract fraction added as such and obtained from a petroleum lubricating oil stock. No. 2,247,475. Ulric B. Bray and Donald E. Carr to Union Oil Company of California.

U. S. Chemical Patents

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Motor fuel containing constituents normally tending to produce gummy and resinous deposits in internal combustion engines containing a small quantity of high boiling oxygenated gum solvent of the dibutylphthalate type together with a small quantity of a solvent extract from petroleum adapted to plasticize said gummy and resinous deposits to minimize sticking of valves and rings. No. 2,247,476. Ulric B. Bray to Union Oil Company of Calif.

Process of converting heavy hydrocarbon oils into gasoline. No. 2,247,-535. Vandeveer Voorhees to Standard Oil Company.

A liquid grease and lubricant composition. No. 2,247,577. Marcellus T. Flaxman to Union Oil Co. of California.

Process for the conversion of hydrocarbon oils. No. 2,247,740. Charles H. Angell to Universal Oil Products Co.

A mineral oil composition of the type adapted for use in turbines and transformers. No. 2,247,807. Everett W. Fuller to Socony-Vacuum Oil Company, Inc.

In refining of petroleum hydrocarbons the improvement of reducing the viscosity where necessary and then subjecting product at same time to action of sulfuric acid and an aryl nitro in which NO_2 group is attached directly to a benzene ring. No. 2,247,926. William A. Smith.

Method of removing impurities from petroleum lubricating oils and motor and petroleum heating fuels and increasing their color stability and reducing their tendency to gum and sludge formation, comprises treating such oils and fuels at the same time with concentrated sulfuric acid and an aryl amine. No. 2,247,927. William A. Smith.

Resins, Plastics, etc.

Process preparing interpolymers comprises subjecting to polymerizing conditions a mixture containing as the polymerizable components thereof, one part of methacrylic acid and 2-20 parts of a monohydric alcohol ester of methacrylic acid. No. 2,244,702. Leo P. Hubbuch to E. I. du Pont de Nemours & Co.

Manufacture of vinyl resins. No. 2,245,040. Barnard M. Marks to E. I. du Pont de Nemours & Co.

Method making pigmented acid resin emulsion. No. 2,245,100. Isidor M. Bernstein to Interchemical Corp.

Polyvinyl acetal resin compositions containing the butyl ether of diethylene glycol succinate. No. 2,245,232. Henry B. Smith to Eastman Kodak Co.

Process for producing undulated synthetic filaments. No. 2,245,310. Hein I. Waterman and Willem L. Johannes de Nie to Shell Development Co.

A process for producing urea resin compositions suitable for use as coating, adhesive compositions and the like. No. 2,245,491. Adolf Menger and Paul Didden to Plaskon Co., Inc.

Process for polymerizing styrene in a light oil styrene fraction. No. 2,245,619. John T. Stearn to The United Gas Improvement Company.

Lubricating grease comprising a mineral oil component thickened by the addition of a soap in which the major portion of the mineral oil component is extracted obtained by the sulfuric acid-nitrobenzene treatment of a Pennsylvania type oil. No. 2,245,772. Nelson J. Gothard and George Entwistle, Jr. to Sinclair Refining Co.

Machine bearing comprising a solid polymer having a continuous carbon to carbon chain and which softens at temperatures above 90°C. No. 2,246,092. Lucius Gilman to E. I. du Pont de Nemours & Co.

Resins and process for their preparation. No. 2,246,321. Raphael Rosen to Standard Oil Development Co.

Resinous product having anion exchange properties and process of producing same. Nos. 2,246,526-527. Easton Melof to National Aluminate Corp.

Normally flexible plasticized polyvinyl alcohol composition containing as a thermostabilizing agent a substance selected from the group consisting of the soluble haloids of ammonium, of alkali metals and of alkaline earth metals. No. 2,246,915. Charles Dangelmajer to Resistoflex Corp.

Cresol-hydrocarbon-formaldehyde condensation product. No. 2,247,411. Fritz Rostler, Vilma Mehner and Leopold Bornstein.

Method for preparing synthetic resins. No. 2,247,422. Harold J. Tattersall to Imperial Chemical Industries, Ltd.

Formaldehyde condensation product. No. 2,247,735. Georg Spielberger and Otto Bayer, and Wilhelm Bunge to General Aniline and Film Corp.

Phenol-formaldehyde resinous composition. No. 2,247,772. Gaetano F. D'Alelio to General Electric Co.

Color stable di-naphthyl methane resin. No. 2,247,940. William H. Carmody to The Neville Co.

Plastic composition comprising as an essential ingredient a rubber hydrochloride intimately admixed with a minor proportion of lead chromate. No. 2,248,025. James B. Holden to Wingfoot Corp.

Rubber

Method and means for processing latex. No. 2,244,948. Theodor Hoenemann and Henry A. Stuart to Goodyear Footwear Corp.

Method of making sponge rubber. No. 2,246,315. Linwood A. Murray, Jr. to United States Rubber Co.

Sponge rubber process. No. 2,246,780. Almon J. Cordrey to Industrial Process Corp.

Method of purifying and concentrating caoutchouc dispersions or the like. No. 2,247,065. Wolfgang Pauli and Paul Stamberger to Dunlop Plantations Ltd.

Method of forming pure rubber chloride. No. 2,247,407. James W. Raynolds to The Raolin Corp.

Process vulcanizing a vulcanizable rubber mix in the presence of a compound having the formula $D-S-CH_2-\underset{\underset{O}{\|}}{C}-X$ wherein D is a thiocarbamyl group and X is an amino group. No. 2,247,917. Joy G. Lichty to Wingfoot Corp.

Rubber bonded to artificial silk. No. 2,247,923. Theodore A. Riehl to Wingfoot Corp.

Method vulcanizing rubber in the presence of a ketone containing from three to four arylthiazyl-thio groups attached alpha to the carbonyl group, not more than two such arylthiazyl-thio groups being attached to the same carbon atom. No 2,247,918. Joy G. Lichty to Wingfoot Corp.

Method making abrasive article comprising reducing rubber to a fluid, forming a heteropolymer by reacting said fluid with an alpha-beta unsaturated carbonyl compound while retaining the mass at a temperature of approximately between 60 to 70 degrees centigrade, mixing abrasive grain and sulfur with said heteropolymer, shaping articles from the mass, and curing the shaped articles. No. 2,248,031. Hugh V. Allison to The Allison Co.

Textiles

In process for drying thread or yarn on a heated rotating surface, steps comprising passing thread in approximately helical path over said surface and gradually decreasing temperature of said surface as the moisture content of the thread decreases in the course of the drying operation. No. 2,244,744. Johannes Uytenbogaart and Carl F. Gram to North American Rayon Corp.

Method of forming a textile yarn of a soft and lustrous character from discontinuous fibers. No. 2,244,761. John Brandwood.

Method making a crinkled rayon fabric. No. 2,244,767. James F. Corbett and Kenneth H. Barnard to Pacific Mills.

Process for the production of a crimped yarn. No. 2,244,832. Donald Finlayson and Ronald Bezant to Celanese Corp. of Amer.

In fabric printing process the step of printing on the fabric with a composition containing polyvinyl aceto-formal approximately 18%, plastifiers totaling approximately 18% and solvents totaling approximately 64%. No. 2,245,123. Maurice Belloc to Societe Nobel Francaise.

Treatment of cellulosic textiles with long chain vinyl ethers. No. 2,245,132. Julian W. Hill and Robert W. Maxwell to E. I. du Pont de Nemours & Co.

A low draft process of producing a synthetic pubescent yarn closely simulating true spun yarn. No. 2,245,191. Edgar G. Guenther and Wendell G. Faw to Eastman Kodak Co.

Process of conditioning yarn to render it more amenable to textile operations. No. 2,245,260. Joseph B. Dickey and James B. Normington to Eastman Kodak Co.

Yarn treating composition and process. No. 2,245,412. Forrest D. Pilgrim and Edwin A. Robinson to Eastman Kodak Co.

Process of introducing nitrogen into the molecule of textile materials of foils. No. 2,246,070. Paul Schlack to Walter H. Duisberg.

Method of producing fibers consisting chiefly of cellulose hydrate but having substantially the same affinity for acid wool dyestuffs as wool. No. 2,246,511. Paul Esselmann, Karl Kosslinger, and Joseph Dusing to Walther H. Duisberg.

Method of continuously processing freshly spun viscose thread. No. 2,246,735. Hayden B. Kline, Louis S. Fryer and Alden H. Burkholder to Industrial Rayon Corp.

Manufacture of synthetic fibers. No. 2,246,899. Jan J. Schilthuis and Johan D. W. Hubbeling to American Enka Corp.

Cuproammonium cellulose spinning solution and method of preparing same. No. 2,247,124. William H. Furness to American Rayon Co., Inc.

In process of rendering fabric resistant to fungal and bacterial attack which comprises heating the fabric in a solution of one of a group of metallic inorganic salts consisting of copper sulfate and cadmium sulfate and thence immersing in morpholine. No. 2,247,339. Helen M. Robinson.

Improved method of sizing textiles to render same crush-proof and crease-proof. No. 2,247,353. Lásló Auer.

Method of producing staplised yarn. No. 2,247,471. Angus S. Bell to Celanese Corp. of America.

Production from continuous filaments of yarns exhibiting the characteristics of staple fiber yarns. No. 2,247,529. William I. Taylor, Leslie B. Gibbins and Alfred H. Woodruff to Celanese Corp. of America.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

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Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost by E. L. Luaces, 1107 Broadway, New York.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. We expect to begin reporting German patents in the near future. Your comments and criticisms will be appreciated.

CANADIAN PATENTS

Granted and Published January 14, 1941.

Producing crepe effects on fabrics containing high twist yarns. No. 393,-847. Henry Dreyfus.

Meat concentrate composed of the product of spray drying an aqueous extract of meat from which heat coagulable constituents have been removed. No. 393,895. Armour & Co. (Norman C. Fischer.)

Dry cell electrode in which the zinc sheets are separated by layers of vinyl acetate resin. No. 393,903. Burgess Battery Company of Delaware. (Charles F. Burgess.)

Method of manufacturing fine wires of aluminum. No. 393,906. Canadian General Electric Co. Ltd. (Marvin Pipkin.)

Stabilizing sensitometric characteristics of an unexposed photographically sensitive emulsion comprising a suitable colloid carrier and silver halide. No. 393,913. Canadian Kodak Co. Ltd. (Marion E. Russell and Loyd A. Jones.)

Method of making a direct positive emulsion. No. 393,914. Canadian Kodak Co. Ltd. (John E. Leermakers.)

Method of coating a layer of polyvinyl acetaldehyde acetal resin on a rigid support. No. 393,915. Canadian Kodak Co. Ltd. (Charles R. Fordyce.)

Method of preventing abrasion of the surface of photographic film containing a visible image. No. 393,917. Canadian Kodak Co. Ltd. (Ralph H. Talbot.)

Method for increasing the reflectance of a white titanium dioxide pigment in the shorter wavelengths of the visible spectrum relative to the reflectance of the said pigment in the longer wavelengths of the visible spectrum. No. 393,919. Canadian Titanium Pigments Limited. (Roy Dahlstrom.)

Polyalkylene glycol dihexoates of the group consisting of n-hexoates, 2-ethyl butyrates and 2-methyl pentoates. No. 393,921. Carbide and Carbon Chemicals Limited. (George H. Reid.)

Preparing an acetoacetyl amide by reacting diketene and a water dispersion of a nitrogen-containing compound selected from the group consisting of primary and secondary aliphatic amines, and ammonia. No. 393,922. Carbide and Carbon Chemicals Limited. (Albert B. Boese, Jr.)

Stabilizing light-sensitive vinyl resins including a vinyl halide polymerized therein. No. 393,923. Carbide and Carbon Chemicals Limited. (Arthur K. Doolittle.)

Treating textile materials with hardenable condensation products obtained from aldehydes and aminotriazines. No. 393,926. Ciba Products Corp. (Gustav Widmer and Willi Fisch.)

Salad dressing emulsion comprising comminuted soya bean material from which oil and fibre has been removed mixed with water, edible oil, and edible organic acid. No. 393,927. Continental Soya Co. Ltd. (Robert J. Gilmour.)

Process for crystallization of dextrose hydrate. No. 393,928. Corn Products Refining Co. (Charles J. Copland.)

Apparatus for dispersing zein. No. 393,929. Corn Products Refg. Co. (Amos H. Flint and Lloyd C. Swallen.)

Purifying of high boiling point ester by treating with a salt of perboric acid. No. 393,932. Distillation Products. Inc. (James G. Baxter and Robert L. Edwards.)

Improving tobacco by steeping in a bath at 160-212°F in presence of a penetrating agent and then in an extraction bath containing hydrogen peroxide at pH 8-11. No. 393,935. E. I. du Pont de Nemours & Co. (Alfred T. Hawkinson.)

Photographic gelatine printing relief. No. 393,940. General Aniline & Film Corp. (Max Herbst and Walter Frankenburger.)

High-speed infra-red film comprising a panchromatic sensitized emulsion and an infra-red sensitized emulsion thereon. No. 393,941. General Aniline & Film Corp. (Walter Barth and Herman H. Duerr.)

Photographic gelatine printing relief. No. 393,942. General Aniline & Film Corp. (Walter Frankenburger and Georg Rössler.)

Paste for negative plates of storage batteries comprising litharge combined with sulfuric acid and with the reaction product of waste sulfite liquor and nickel phosphate. No. 393,943. General Motors Corp. (Robert A. Daily.)

Treating hydrocarbon gases to effect polymerization and the recovery of desirable liquid products. No. 393,949. Houdry Process Corp. (Eugene J. Houdry.)

Mixing naphtha-soluble liquid soap with an inert finely divided skeletal material to form powderable material and lightly grinding the resulting product. No. 393,953. Keystone Aniline & Chemical Co. (Victor O. Olsen.)

Method of separating magnesium and like metals by sublimation in a high frequency furnace. No. 393,954. Lancastershire Metal Subliming Corp. Ltd. (Harold A. Blackwell and William L. Turner.)

Separating any one element such as phosphorus, sodium, silicon, sulfur and aluminum from compounds containing it by heating in a high-frequency furnace and then fractionally condensing it. No. 393,955. Lancashire Metal Subliming Corp. Ltd. (Harold A. Blackwell and William L. Turner.)

Process of producing magnetic powder for iron dust cores. No. 393,958. Micro Products Corp. (Hans Vogt.)

Water soluble adhesive composition consisting essentially of Hydroresin 20-25 parts, animal glue 3-15 parts, Rezinal up to 8 parts, and potassium hydroxide up to 1 part. No. 393,959. McLaurin-Jones Co. (Lewis Davis.)

Method of making electrolytic iron. No. 393,972. Reynolds Metals Co. (Marshall G. Whitfield and Victor Sheshunoff.)

Process for conversion of hydrocarbon oils. No. 393,987. Universal Oil Products Co. (Jacque C. Morrell.)

Bodying tung oil by heating to approximately 540°F and then before gelation occurs cooling rapidly to below about 350°F, the process being conducted in the absence of resin. No. 393,988. The Vellumoid Co. (Leander H. Hills.)

Process of dyeing pelts, hairs, feathers, etc., by treating said materials mordanted with a mordant of the group consisting of chromium, iron and copper mordants in a bath containing an oxidizing agent and a salt-like compound of the general formula A-N=N-B-OH. H_2N-R wherein A is a radical of the benzene series, B is an aromatic radical of the group consisting of benzene and naphthalene radicals, and R is an amino compound of the group consisting of amino benzenes, aminodiphenylamines and heterocyclic amines. No. 393,996. I. G. Farbenindustrie A. G. (Erich Lehmann.)

Multiple plating of metals. No. 393,998. Ellis Miller. (Siegfried Deutsch.)

Producing azodyestuffs on mixtures consisting of wool and cellulose fibres by combining coupling components and diazocompounds on the fibres and employing as coupling components 6-sulfo-2-hydroxynaphthalene-3-carbonyl-arylamides. No. 393,999. Heinrich Morschel, Ludwig Mussler, Hans Krzikalla and Wolfgang Alt.

Preparation of acid amide-like constituted condensation products. No. 394,000. Gerhard Balle and Heinz Schild.

Process of producing compounds of the pyrimidine series. No. 394,001. Willy Braun and Karl Koeberle.

Granted and Published January 21, 1941.

Process of electrogalvanizing by passing a current at high cathode density through a concentrated ammoniacal zinc solution containing ammonia in excess of the amount required to form zinc tetramine with all the zinc in solution. No. 394,004. John P. Hubbell and Louis Weisberg.

Method of preparing a steel surface for painting which includes mechanical treatment and a phosphoric acid treatment. No. 394,010. Clete L. Boyle.

Fire-kindler comprising wood shavings which have been immersed in molten paraffin containing liquid combustibles. No. 394,045. Eucharisté Simard.

Method of preparing a stabilized colloidal graphite. No. 394,057. Acheson Colloids Corp. (Floyd E. Bartell.)

Preparing nitrogen-containing organic compounds by admixing equal parts of digester tankage and fish oil, heating in absence of air at 250-350°C and condensing an oily distillate given off. No. 394,065. Armour & Co. (Anderson W. Ralston and William M. Selby.)

Preparation of β-(p-hydroxyphenyl)-isopropylmethylamine. Nos. 394,-070 to 394,073. E. Bilhuber, Inc. (Gustav Mannheim.)

Heat generating composition and package for hair waving. No. 394,074. Lawrence Richard Bruce, Inc. (Abraham R. Goldfarb and Edwin B. Michaels.)

Lead frit comprising silica, lead oxide and titanium oxide, the proportion of lead oxide being from 63-80% and of titanium oxide from 1-10%. No. 394,080. Canadian Titanium Pigments Ltd. (Norman J. Read.)

Improved process of making a bonded abrasive. No. 394,084. The Carborundum Co. (Norman P. Robie.)

Method of treating a well with acid. No. 394,091. The Dow Chemical Co. (Willard H. Dow and John J. Grebe.)

Method of treating a well with acid. No. 394,092. The Dow Chemical Co. (Orie N. Maness.)

Method of treating an oil well in a calcareous formation with hydrochloric acid. No. 394,093. The Dow Chemical Co. (Frank A. Denker.)

Smooth, viscous, liquid coating composition comprising undried buttermilk solids, including acid precipitated casein, albumin, and about 5% or more fats and fat-like substances such as lecithin, said coating including an alkaline casein dissolving agent in which said casein has been dissolved while in the undried state. Nos. 394,116 and 394,117. Arthur D. Little, Inc. (Charles G. Hartford.)

Method of recovering from an iron ore or equivalent oxide that contains also a secondary metallic content the two metals, separate from each other. No. 394,127. Plastic Metals, Inc. (John L. Young.)

Catalytic body suitable for oxidation of ammonia comprising a ceramic

Foreign Chemical Patents

Canadian and English—p. 51

body having about 30% porosity and containing about 1% finely divided platinum. No. 394,134. Shell Development Co. (Maarten Voogd.)

Chlorination of ethylene to vinyl chloride by direct chlor-substitution at temperature from 300-500°C.No. 394,135. Shell Development Co. (Herbert P. A. Groll, George Hearne, James Burgin and Donald S. LaFrance.)

Process for refining naphthenic acids containing neutral oils and harmful sulfur compounds. No. 394,136. Shell Development Co. (Raymond C. Rich and Curtis W. Cannon.)

Decolorizing glycerol by extracting anhydrous distilled glycerine with an iso-octane at from 80-150°C., separating the extract and raffinate phases, and fractionally distilling the raffinate phase to obtain decolored glycerol. No. 394,137. Shell Development Co. (Theodore Evans.)

Treatment of oil wells to convert water wet sand to one preferentially wettable by oil. No. 394,147. Texaco Development Co. (Allen D. Garrison.)

Coating well holes with a casein plastic in drilling wells with drilling mud circulation. No. 394,149. Texaco Development Co. (Sterling P. Hart.)

Method of chromium plating on a zinc base. No. 394,151. Western Electric Co., Inc. (Morris Brown and Arthur M. Wagner.)

Reacting upon a phenanthrolin containing in at least one of the positions 2- and 4-, 2'- and 4'- respectively (alpha and gamma positions with regard to the nuclear nitrogen atom) a halogen atom with a compound selected from the group consisting of alcohol and phenol compounds in the presence of an acid binding agent and in the presence of a diluent. No. 394,161. Winthrop Chemical Co., Inc. (Hans Henecka.)

Producing rubber-like polymerization products by polymerizing a member of the group consisting of butadiene and its substitution products in the presence of solid highly polymerized isobutylene. No. 394,173. I. G. Farbenindustrie A. G. (Martin Mueller-Cunradi and Walter Daniel.)

Producing rubber-like polymerization products by polymerizing vinyl carbazole in presence of solid highly polymerized isobutylene. No. 394,174. I. G. Farbenindustrie A. G. (Martin Mueller-Cunardi and Walter Daniel.)

Producing pyrazine-carboxylic acid derivatives by condensing pyrazine-carboxylic acid hydrazine with aldehydes or ketones, or substituted aldehydes or ketones; or with mono-oxo-aldehydes or ketones or substituted mono-oxo-aldehydes or ketones. No. 394,176. Merck & Co., Inc. (Otto Dalmer, Claus Diehl and Eugen Walter.)

Manufacturing a drying oil from castor oil by heating it at 150-250°C in presence of a small amount of a sulfo compound of a lower aliphatic hydrocarbon. No. 394,177. N. V. Industrielle Mij. Voorheen Noury & van der Lande. (Remmet Priester.)

In dyeing mixed fabrics with diazo colors which are diazotized on the fibre and developed, using as developer a compound of the group consisting of 1-methylol-2-hydroxynaphthalene and 2-hydroxy-naphthalene-1-carboxylic acid. No. 394,178. Paul Rabe and Hans Roos.

Producing aminocarboxylic acid nitriles by reacting a salt of ethylene diamine with an aldehyde and hydrocyanic acid, the latter being produced in the reaction chamber. No. 394,179. (Heinrich Ulrich and Ernst Ploetz.)

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Manufacture and production of polymerization products from isobutylene. No. 525,542. I. G. Farbenindustrie A. G.

Coating material for camouflage purposes. No. 525,543. W. F. W. Edwardes.

Method of imparting a glazed surface to walls. No. 525,399. Granitese (Great Britain), Ltd.

Method and apparatus for evaporation and heat treatment of liquids and sludgy materials. No. 525,547. Charms Co.

Process for the manufacture of refined products from hydrocarbon mixtures. No. 525,403. N. V. de Bataafsche Petroleum Mij.

Treatment of hydrocarbons. No. 525,554. Texaco Development Corp.

Manufacture of laminated wood structures. No. 525,556. A. A. D. Lang and S Whyte.

Process for plasticizing rubber. No. 525,335. L. Cooper.

Lip rouge preparation. No. 525,337. M. Klimist

Manufacture of compositions for the treatment of fibrous materials. No. 525,338. Chemical Works, formerly Sandoz.

Means for disinfecting water closets and lavatories. No. 525,562. E. E. Vipond.

Process and apparatus for the electrodeposition of tin alloys. No. 525,364. S. W. Baier and D. J. Macnaughtan.

Sensitized photographic emulsions. No. 525,365. Kodak, Ltd

Dyeing casein artificial fibre. No. 525,371. H. Dosne.

Cigarette paper for filter-tip cigarettes. No. 525,471. J. Escott.

Hardened lead alloys particularly adapted for use in bearings. No. 525,375. National Lead Co.

Method for separating metals from mixtures of compounds of the metals. No. 525,376. Phelps Dodge Corp.

Luminescent materials and their manufacture. No. 525,379. General Electric Co., Ltd.

Splitting of fats. No. 525,381. Montecatini Societa Generale per l'Industria Mineraria e Chimica.

Production of aluminum fluoride. No. 525,387. Rutgerwerke A. G.

Process for the separation of different fractions of different properties from mixtures of hydrocarbons by crystallization. No. 525,388. N. V. de Bataafsche Petroleum Mij.

Measurement of the concentration of oxidizing or reducing agents in water. No. 525,423. Kent, Ltd.

Furnace installation for melting and refining metals and metallurgical products. No. 525,430. Metallgesellschaft A. G.

Manufacture of sheets and plates of reinforced glass. No. 525,442 Compagnies Reunies des Glaces et Verrex Speciaux du Nord de la France.

Catalytic cracking of hydrocarbon oils. No. 525,443. Standard Oil Development Company.

Apparatus for heating oils, gums, resins and other constituents of varnish or the like. No. 525,392. C. R. Robinson, J. W. Everingham and Keystone Paint & Varnish Co., Ltd.

Treatment of hydrocarbons with absorptive catalysts. No. 525,444. Standard Oil Development Co.

Coagulation of pigments in suspension. No. 525,472. E. I. du Pont de Nemours & Co., Inc.

Manufacture of condensation products. No. 525,456. Albert Products, Ltd.

Manufacture of ether alcohols. No. 525,473. Bohme Fettchemie Ges.

Manufacture of malleable iron. No. 525,478. General Motor Corp.

Apparatus for deodorizing and cooling, and if desired, pasteurizing liquids under vacuum. No. 525,488. Murray Deodorisers, Ltd.

Extraction of wax from peat by means of solvents. No. 525,501. J. Reilly, D. F. Kelly and J. Duffy.

Treatment of minerals by froth flotation. No. 525,506. M. Vovel-Jorgensen.

Finishing of surfaces or coating compositions adapted for use therein. No. 525,512. B. B. Chemical Co., Ltd., L. E. Puddefoot and P. F. Wright.

Contact towers, dephlegmators and other chemical towers. No. 525,575. Bamag, Ltd., and A. H. Manning.

Production of textile threads. No. 525,577. Courtaulds, Ltd., and D. L. Wilson.

Water softening and the flocculation of suspended solids in aqueous liquids. No. 525,581. J. O. Samuel and Unifloc Reagents, Ltd.

Gas masks. No. 525,586 Société Belge de l'Azote et des Produits Chimiques du Marly.

Gaseous fuels. No. 525,587. S. H. White.

Apparatus for distributing finely divided materials. No. 525,614. M. Vogel–Jorgensen.

Process and apparatus for making rubber filaments. No. 525,467. F. H. Reichel.

Manufacture of stable suspensions of graphite or other finely divided products. No. 525,588. A. Hasson and J. Moussafir.

Production of carbon blacks, particularly for rubber compounding. No. 525,621. Societa Italiana Pirelli.

Processes for protecting articles of magnesium and its alloys from corrosion. No. 525,590. L. Renault.

Manufacture of steel by the basic Bessemer process. No. 525,591. H. A. Brassert & Co., Ltd.

Apparatus for maturing paper. No. 525,641. Sturtevant Engineering Co., Ltd., and M. F. Stevens.

Manufacture of disazo dyestuffs. No. 525,642. J. R. Geigy A. G.

Concentration of dispersions of rubber or like material. No. 525,656. C. Bondy

Liquid and vapor separators. No. 525,669. British Thomson-Houston Co., Ltd.

Varnishing or rubber and the like. No. 525,671. Dr. A. Wacker Gesellschaft fur Elektrochemische Industrie Ges.

Detergents. No. 525,514. B. Laporte, Ltd. and I. E. Weber.

Process for the manufacture of fatty aromatic chloromethyl compounds. No. 525,673. I. G. Farbenindustrie A. G.

Manufacture of polyamides. No. 525,516. E. I. du Pont de Nemours & Co., Inc.

Manufacture of electric resistance material. No. 525,517. Aktiebolaget Kanthal.

Method and apparatus for canning. No. 525,522. American Can Company.

Plastic moulding material. No. 525,525. E. M. Bright.

Tubular type heat exchangers. No. 525,531. H. Koppers' Industrielle Mij. N. V.

Device for the distribution of heating gas for underjet coke ovens. No. 525,526. H. Koppers' Industrielle Mij. N. V.

Regenerative horizontal or retort oven. No. 525,533. H. Koppers' Industrielle Min. N. V.

Deterioration retardants. No. 525,534. United States Rubber Co.

Method of soft soldering insulated flexible electric conductors. No. 525,597. N. V. Pope's Metaaldraadlampenfabriek.

Microporous rubber filtering media. No. 525,537. United States Rubber Co.

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Metallurgical furnace. No. 525,709. H. L. Gentil.

Process for the improvement of textiles. No. 525,811. F. Axelrad.

Manufacture of flexible sheet material. No. 525,678. Gevaert Photo-Production N. V., R. G. Tritsmans and S. Hendricx.

Aluminum alloys and the production thereof. No. 525,878. J. Stone & Co., Ltd., A. J. Murphy and S. A. E. Wells.

Dust collecting plants. No. 525,954. Buell Combustion Co., Ltd.

Processes for the manufacture of polarizing materials. No. 525,956. International Polaroid Corp.

Purification of coal tar hydrocarbons. No. 525,813. Yorkshire Tar Distillers, Ltd., E. B. Maxted and S. Billbrough.

Catalytic purification of coal tar hydrocarbons. No. 525,814. Yorkshire Tar Distillers, Ltd., E. B. Maxted and S. Billbrough.

Preparation of dried foodstuffs from bananas. No. 525,820. E. J. Dyer.

Foaming or granulating blast furnace slag or other suitable molten material. No. 525,822. Holland & Hannen & Cubitts, Ltd. and M. Galli-Hatchard.

Production of resinous condensation products. No. 525,881. Beck, Koller & Co. (England), Ltd., A. G. Hovey and T. S. Hodgins.

Treatment of boiler flue gases. No. 525,883. Simon-Carves, Ltd., and J. H. Leigh.

Extraction of wax from peat. No. 525,696. J. Reilly, D. F. Kelly and J. Duffy.

Process and apparatus for the degasification and or dehydration of oils and the like. No. 525,704. W. J. Fraser & Co., Ltd. and J. W. Phipps.

Manufacture of propenyl benzene derivatives. No. 525,705. Stafford Allen & Sons, Ltd. and T. F. West.

Treating molten iron or steel and addition agents therefor. No. 525,706. Electro-Metallurgical Co.

Method of producing sulfur from gases containing sulfur dioxide. No. 525,730. A. G. Exploration Co., Ltd. and C. T. Hill.

Manufacture of synthetic rubber-like materials. No 525,733. I. G. Farbenindustrie A. G.

Coloring of artificially produced oxide films on light metals. No. 525,734. British Anodising, Ltd., S. R. Sheppard and J. M. Perfect.

Apparatus for the nebulization of liquids. No. 525,736. G. W. Parr and C. Austen, Ltd.

Rubber anti-oxidants. No. 525,737. W. Baird, M. Jones and Imperial Chemical Industries, Ltd.

Manufacture of artificial threads, strips or bands from protein solutions. No. 525,738. N. V. Onderzoekingsinstituut Research.

Preparation of cellulose ethers. No. 525,739. R. Wallach.

Patterned rubber and the manufacture thereof. No. 525,756. Dunlop Rubber Co., Ltd., and N. Jones.

Non-skid treat band or over-tire for use on vehicle wheels. No. 525,757. G. Ingram.

Color-forming developers and processes of color development. No. 525,765. Kodak, Ltd.

Making bread and other bakery products. No. 525,766. Kelcox Co.

Process for producing hydrocarbon fractions. No. 525,775. N. V. de Bataafsche Petroleum Mij.

Additional Specifications accepted and published Sept. 18, 1940 will be given next month.